

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SYNGENTA CROP PROTECTION AG,
Petitioner,

v.

UPL LTD.,
Patent Owner.

Case PGR2023-00017
Patent No. 11,445,727

PATENT OWNER'S NOTICE OF APPEAL

Pursuant to 35 U.S.C. §§ 141(c), 142, and 329, and 37 C.F.R. § 90.2(a), Patent Owner UPL Ltd. hereby provides notice of appeal to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“Board”) entered on July 26, 2024, (Paper No. 58) (“Final Written Decision”) and from all underlying orders, decisions, rulings, and opinions relating to the post-grant review of U.S. Patent No. 11,445,727 (“’727 patent”) in Case No. PGR2023-00017. This Notice is timely under 37 C.F.R. § 90.3(a)(1), having been filed no later than sixty-three (63) days after the issuance of the Final Written Decision.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner states that the issues on appeal include, but are not limited to:

- the Board’s determination that claims 1-10 of the ’727 patent are unpatentable; and
- All other issues decided adversely to Patent Owner in any orders, decisions, rulings, or opinions underlying or supporting the Final Written Decision.

A copy of the Final Written Decision is attached to this Notice.

Pursuant to 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a)(1), this Notice is being filed with the Director of the United States Patent and Trademark Office, and a copy of this Notice is being concurrently filed with the Board. In addition, a copy of this

Notice and the required docketing fees are being filed with the Clerk's Office for the United States Court of Appeals for the Federal Circuit via CM/ECF in accordance with 37 C.F.R. § 90.2(a)(2), Federal Rule of Appellate Procedure 15, and Federal Circuit Rule 15.

Respectfully submitted,

Dated: September 27, 2024

/Mark J. Feldstein/
Mark J. Feldstein, Reg. No. 46,693
FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP

Lead Counsel for Patent Owner
UPL Ltd.

CERTIFICATE OF SERVICE

I hereby certify that on September 27, 2024, in addition to being filed and served electronically through the Patent Trial and Appeal Board's P-TACTS System, this **PATENT OWNER'S NOTICE OF APPEAL** was filed with and served on the Director of the United States Patent and Trademark Office via email at the following:

Office of the General Counsel
U.S. Patent and Trademark Office
efileSO@uspto.gov

I also hereby certify that on September 27, 2024, this **PATENT OWNER'S NOTICE OF APPEAL** and the requisite docketing fees were filed with the Clerk's Office of the United States Court of Appeals for the Federal Circuit via CM/ECF.

I further hereby certify that on September 27, 2024, this **PATENT OWENR'S NOTICE OF APPEAL** was served by electronic mail on the following counsel for Petitioner:

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Petitioner has consented to electronic service by email.

Dated: September 27, 2024

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SYNGENTA CROP PROTECTION AG,
Petitioner,

v.

UPL LTD.,
Patent Owner.

PGR2023-00017
Patent 11,445,727 B2

Before SUSAN L. C. MITCHELL, ZHENYU YANG, and
MICHAEL A. VALEK, *Administrative Patent Judges*.

YANG, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 328(a)

Granting Petitioner's Motion to
Submit Supplemental Information (Paper 14)
37 C.F.R. § 42.223(a)

Denying in Part and Dismissing in Part Petitioner's Motion to Exclude
(Paper 48)
37 C.F.R. § 42.64(c)

Denying Patent Owner's Motions to Seal (Papers 30, 45)
37 C.F.R. §§ 42.14, 42.54

I. INTRODUCTION

Syngenta Crop Protection AG (“Petitioner”) filed a Petition (Paper 2, “Pet.”), requesting post-grant review of claims 1–10 of U.S. Patent No. 11,445,727 B2 (Ex. 1001, “the ’727 patent”). UPL Ltd. (“Patent Owner”) filed a Patent Owner Preliminary Response. Paper 6 (“Prelim. Resp.”). We instituted trial to review the challenged claims (Paper 8, “DI”).

Thereafter, Patent Owner filed a Response (Paper 31, “PO Resp.”), Petitioner filed a Reply to Patent Owner’s Response (Paper 41, “Reply”), and Patent Owner filed a Sur-reply to Petitioner’s Reply (Paper 46, “Sur-reply”).

An oral hearing for this proceeding was held on April 15, 2024, and the transcript of that hearing is of record. *See* Paper 57 (“Tr.”).

The Board has jurisdiction under 35 U.S.C. § 6 and issues this Final Written Decision pursuant to 35 U.S.C. § 328 and 37 C.F.R. § 42.73. For the reasons provided below, we find Petitioner has shown, by a preponderance of the evidence, the unpatentability of claims 1–10.

A. *Related Matters*

According to Patent Owner, the ’727 patent is not involved in any related litigation matters. Paper 4, 1.

The parties identify certain U.S. and foreign patent applications, as well as certain foreign post-grant oppositions as related to the ’727 patent. *Id.*; Pet. 4–5: Paper 13, 1.

B. *The ’727 Patent and Related Background*

The ’727 patent relates to a combination of fungicides. Ex. 1001, 1:14–15.

The ’727 patent explains that fungicides are important to control diseases and to improve yields and quality of the crops. *Id.* at 1:22–24.

Various fungicides were developed over the years, including succinate dehydrogenase inhibitor (SDHI) fungicides, a family of broad-spectrum fungicides with a high potency. *Id.* at 1:24–30. Benzovindiflupyr was a known SDHI fungicide. *Id.* at 3:56–4:15.

According to the '727 patent, prior art taught mixing other classes of fungicides, such as quinone outside inhibitors, ergosterol-biosynthesis inhibitors, and fungicides that act on multiple sites, with SDHI fungicides to achieve a broad spectrum of disease control. *Id.* at 1:37–48. The '727 patent states:

Dithiocarbamate are known in the art as multi-site fungicides. These fungicides are used for broad-spectrum disease control in more than 70 crops. Mancozeb is especially important for controlling devastating and fast spreading diseases such as *Phytophthora infestans*, *Venturia inaequalis* etc. Dithiocarbamate fungicides, especially mancozeb, are particularly useful for disease control because of their broad spectrum of activity, high tolerance by crop plants, and general usefulness for controlling fungal plant diseases not controlled by active compounds that act on only a single target site in the fungus.

Id. at 1:50–60.

The '727 patent acknowledges that mancozeb had been combined with various SDHI fungicides for disease control. *Id.* at 1:61–62. It, however, states that there was “a need in the art to improve on the disease spectrum provided by these combinations.” *Id.* at 1:62–64.

The '727 patent also asserts that prior art did not teach the use of ternary or more combinations of SDHI fungicides. *Id.* at 1:48–49. The purported invention of the '727 patent provides a fungicidal combination, combining at least one SDHI fungicide, at least one dithiocarbamate fungicide, and at least another fungicide. *Id.* at 2:30–33.

According to the '727 patent, the addition of a dithiocarbamate fungicide to the combinations of SDHI with at least another fungicide “resulted in surprising and unexpected advantages,” including “an enhancement of the efficacy, and a surprising reduction in fungal disease incidence.” *Id.* at 3:11–32.

C. Illustrative Claims

Claims 1, 2, 5, and 10 are independent claims. They are illustrative of the claimed subject matter and are reproduced below.

1. A fungicidal combination consisting of benzovindiflupyr, mancozeb, and at least another fungicide selected from an ergosterol biosynthesis inhibitor fungicide, and a quinone outside inhibitor fungicide,

wherein the ergosterol biosynthesis inhibitor is selected from azaconazole, bitertanol, bromuconazole, cyproconazole, difenoconazole, diniconazole, epoxiconazole, etaconazole, fenbuconazole, fluquinconazole, flusilazole, flutriafol, hexaconazole, imibenconazole, ipconazole, metconazole, myclobutanil, penconazole, propiconazole, simeconazole, tebuconazole, tetraconazole, triadimefon, triadimenol, triticonazole, prothioconazole, imazalil, oxpoconazole, pefurazoate, prochloraz, triflumizole, fenarimol, nuarimol, pyrifenox, pyrisoxazole, triforine, and mixtures thereof; and

wherein the quinone outside inhibitor fungicide is selected from azoxystrobin, coumoxystrobin, enoxastrobin, flu fenoxystrobin, picoxystrobin, pyraoxystrobin, mandestrobin, pyraclostrobin, pyrametostrobin, triclopyricarb, kresoxim-methyl, dimoxystrobin, fenaminostrobin, metominostrobin, trifloxystrobin, famoxadone, fluoxastrobin, fenamidone, pyribencarb, and mixtures thereof.

2. A fungicidal combination consisting of benzovindiflupyr, mancozeb, an ergosterol biosynthesis inhibitor fungicide, and a quinone outside inhibitor fungicide,

wherein the ergosterol biosynthesis inhibitor is selected from [the same Markush group for ergosterol biosynthesis inhibitor fungicide as recited in claim 1]; and

wherein the quinone outside inhibitor fungicide is selected from [the same Markush group for quinone outside inhibitor fungicide as recited in claim 1].

5. A composition consisting of:

at least one agrochemically acceptable excipient; and

a fungicidal combination of:

(a) benzovindiflupyr;

(b) mancozeb; and

(c) at least one ergosterol biosynthesis inhibitor and/or at least one quinone outside inhibitor;

wherein the ergosterol biosynthesis inhibitor is selected from [the same Markush group for ergosterol biosynthesis inhibitor fungicide as recited in claim 1]; and

wherein the quinone outside inhibitor fungicide is selected from [the same Markush group for quinone outside inhibitor fungicide as recited in claim 1].

10. A method of controlling fungal diseases in plants consisting of, applying to the locus of the plant a combination consisting of:

(a) benzovindiflupyr;

(b) at least one quinone outside inhibitor and/or at least one ergosterol biosynthesis inhibitor; and

(c) mancozeb,

wherein the ergosterol biosynthesis inhibitor is selected from [the same Markush group for ergosterol biosynthesis inhibitor fungicide as recited in claim 1]; and

wherein the quinone outside inhibitor fungicide is selected from [the same Markush group for quinone outside inhibitor fungicide as recited in claim 1].

Id. at 21:40–22:16, 22:25–49, 23:3–29.

D. Asserted Challenges to Patentability

Petitioner asserts the following challenges to patentability:

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1, 3–5, 7, 9, 10	102(a)(1)	Godoy ¹
1, 3–10	102(a)(1)	Tobler ²
1–10	103	Tobler, Godoy
1–10	103	De Oliveira, ³ Wiglesworth, ⁴ Tobler, Godoy
1–10	112	Written Description
1–10	112	Enablement

In addition to other evidence, Petitioner relies on the declarations of Phillip M. Brannen, Ph.D. (Ex. 1003), Sylvia Hall-Ellis, Ph.D. (Ex. 1019), and Caio Prates (Ex. 1020) as support for its Petition. After we issued the DI, Petitioner submitted a supplemental declaration of Sylvia Hall-Ellis, Ph.D. (Ex. 1022) and a declaration of Ryan Kody Jones (Ex. 1023).

In support of its position, Patent Owner relies on the declaration of Barry J. Jacobsen, Ph.D. (Ex. 2020).

¹ Godoy et al., Eficiência de fungicidas multissítios no controle da ferrugem-asiática da soja, *Phakopsora pachyrhizi*, na safra 2015/16: resultados sumarizados dos ensaios cooperativos, Londrina, PR August 2016 (Embrapa Soja, Circular Técnica, 121) (Ex. 1004). We cite the certified English translation of Exhibit 1004 (Ex. 1005, “Godoy”).

² U.S. Patent No. 9,314,022, issued April 19, 2016 (Ex. 1006, “Tobler”).

³ WO Application Pub. No. 2015/079334, published June 4, 2015 (Ex. 1007, “De Oliveira”).

⁴ Wiglesworth et al., Solatenol™ fungicide – a new SDHI fungicide from Syngenta, *Phytopathology* 105(Supl. 2): S2.11–S2.12 (2015) (Ex. 1008, “Wiglesworth”).

II. PETITIONER’S MOTION TO SUBMIT SUPPLEMENTAL INFORMATION

With our authorization (Ex. 3001, 1–2), Petitioner filed a Motion to Submit Supplemental Information, seeking to enter Exhibits 1022–1030 into the record. Paper 14 (“MTSI”). Patent Owner filed an Opposition to the MTSI. Paper 15 (“MTSI Opp.”).

Petitioner, as the moving party, bears the burden of proof that it is entitled to the relief requested in the motion. 37 C.F.R. § 42.20(c). Because Petitioner requested authorization to file a motion to submit supplemental information within one-month of institution (*see* Ex. 3001, 3), it only needs to show that the information is “relevant to a claim for which the trial has been instituted.” 37 C.F.R. § 42.223(a)(2).

Satisfying this relatively low bar, however, does not guarantee that we will grant the motion and allow submission of the supplemental information. *Redline Detection, LLC v. Star Envirotech, Inc.*, 811 F.3d 435, 445 (Fed. Cir. 2015). Instead, our guiding principle in conducting all post grant review proceedings at the Board is to “secure the just, speedy, and inexpensive resolution.” 37 C.F.R. § 42.1(b).

In evaluating a motion to submit supplemental information, we are cognizant that “the introduction of new evidence in the course of the trial is to be expected” during post-grant review trial proceedings, and “as long as the opposing party is given notice of the evidence and an opportunity to respond to it, the introduction of such evidence is perfectly permissible.” *Genzyme Therapeutic Prods. Ltd. P’ship v. Biomarin Pharm. Inc.*, 825 F.3d 1360, 1366 (Fed. Cir. 2016); *see also id.* at 1367 (stating the purpose of the trial in a post grant review proceeding “is to give the parties an opportunity

to build a record by introducing evidence—not simply to weigh evidence of which the Board is already aware”).

On the other hand, the opportunity to submit supplemental information does not allow a petitioner to completely reopen the record, by, for example, changing theories after filing a petition. Thus, we consider whether admission of the supplemental information would change the grounds initially presented in the petition or otherwise unfairly change the evidence underlying those grounds. We also consider whether the patent owner would be unduly prejudiced in having to respond to the supplemental information if permitted.

Under this framework, and for the reasons explained below, we grant Petitioner’s MTSI.

A. Exhibit 1022

Godoy, titled “Efficiency of multisite fungicides in controlling Asian soybean rust, *Phakopsora pachyrhizi*, in the 2015/16 harvest: summarized results of cooperative trials,” is a certified English translation of a report (Ex. 1004) that appeared in Circular Técnica 121. Ex. 1005. Petitioner’s declarant, Dr. Hall-Ellis, testified that she downloaded the original report from the Embrapa website and clicked on the “Further Information” tab there. Ex. 1019 ¶ 47. Based on information contained in that “Further Information” tab, Dr. Hall-Ellis also testified that the report was published on September 1, 2016. *Id.* (referring to Attachment 1b of her Declaration).

In its Preliminary Response, Patent Owner countered that the Petition failed to show Godoy is prior art. Prelim. Resp. 16–22. Specifically, Patent Owner challenged Petitioner’s showing regarding the asserted publication date and public accessibility of Godoy. *Id.*

In the Decision to Institute, we focused our patentability analysis on Tobler. DI 10–16. We, however, acknowledged Patent Owner’s arguments challenging Godoy’s prior-art status as “not unreasonable,” and encouraged the parties to fully develop the record during trial to facilitate the resolution of the fact intensive disputes. *Id.* at 18.

In response, Petitioner filed its MTSI, seeking to submit Exhibit 1022, a Supplemental Declaration of Dr. Hall-Ellis, “to clarify and confirm the information already presented in her Original Declaration (Ex. 1019).” MTSI 4. According to Petitioner, in the Supplemental Declaration, Dr. Hall-Ellis (1) confirms that “Godoy was not only publicly available as of at least September 22, 2016, but was in fact viewed and downloaded as of September 23, 2016;” and (2) “clarifies Attachment 1b of her Original Declaration and demonstrates that Godoy was available in the form of Exhibit 1004.” *Id.* (emphasis removed).

We find, and Patent Owner does not dispute, that Exhibit 1022 is relevant to the challenged claims, for which this trial was instituted. *See* 37 C.F.R. § 42.223(a)(2). Nonetheless, Patent Owner opposes entering Exhibit 1022 into the record. MTSI Opp. 2–6. According to Patent Owner, in submitting Exhibit 1022, “Petitioner seeks to replace its deficient evidence on Godoy’s public *accessibility* with new evidence relying on purported *dissemination*.” *Id.* at 3; *see also id.* at 5 (the same).

To resolve this dispute, we find guidance in *Hulu, LLC, v. Sound View Innovations, LLC* is instructive on. *See* IPR2018-01039, Paper 29 (PTAB Dec. 20, 2019) (precedential) (“*Hulu*”). In *Hulu*, a Board panel issued a decision denying institution of an *inter parties* review because it found insufficient evidence to show that an asserted reference was publicly

accessible. *Id.* at 2. On rehearing, the Board’s Precedential Opinion Panel (POP) disagreed, holding that at the institution stage, a petition for *inter parties* review must show that a reference qualifies as a printed publication by “a reasonable likelihood” standard. *Id.* at 13. It noted that, for post-grant review, the standard is “more likely than not.” *Id.* n.5. The POP explained that “it is a higher standard than mere notice pleading” but “lower than the ‘preponderance’ standard to prevail in a final written decision.” *Id.* at 13.

Applying *Hulu* to the facts of this case, we determine that Petitioner met its burden in the Petition to show that it was more likely than not that Godoy was published before the filing date of the ’727 patent. Pet. 1 (citing Ex. 1019 ¶ 47); Ex. 1019 ¶ 47 (Dr. Hall-Ellis testifying “the ‘Further Information’ tab provides additional information including a publication date of September 1, 2016 (see Attachment 1b)”).

Attachment 1b to Dr. Hall-Ellis’s original declaration shows three dates: “current date: 09/01/2016,” “Date of last update: 09/22/2016,” and “Year of publication: 2016.” Ex. 1019, Attachment 1b. We agree with Patent Owner that merely showing that the “Year of publication” was 2016, alone, would not demonstrate that Godoy qualifies as prior art because the priority date of the challenged claims is November 4, 2016. *See* PO Resp. 12–13. The first page of Godoy, however, bears the date of “August 2016.” Ex. 1005, 1. We find that date, together with the two September dates shown on Attachment 1b, shows that it was “more likely than not” that Godoy was published before November 4, 2016.

Patent Owner argues that even if Godoy was published before November 4, 2016, it is unclear “to whom it was published.” PO Resp. 11; *see also id.* at 14 (“Dr. Hall-Ellis provides no evidence that Godoy was

indexed, searchable, or otherwise disseminated prior to November 4, 2016.”). In other words, Patent Owner challenges the public accessibility of Godoy.

A reference is considered publicly accessible if it is “made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it.” *Jazz Pharms., Inc. v. Amneal Pharms., LLC*, 895 F.3d 1347, 1355 (Fed. Cir. 2018). To “determine whether an interested researcher would have been sufficiently capable of finding the reference and examining its contents,” we “must consider all of the facts and circumstances surrounding the disclosure.” *In re Lister*, 583 F.3d 1307, 1312 (Fed. Cir. 2009); *see also In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004) (explaining that a determination of whether a reference qualifies as a printed publication “involves a case-by-case inquiry into the facts and circumstances surrounding the reference’s disclosure to members of the public”).

Here, the first page of Godoy bears the logo of “Embrapa.” Ex. 1005, 1. Patent Owner’s declarant, Dr. Jacobsen, explained that Embrapa is the Brazilian equivalent of the U.S. Department of Agriculture. Ex. 1043, 52:20–53:8. He also testified that “a scientist interested in soybean diseases would be keeping track of what’s going on in Brazil” and “what’s going on with respect to EMBRAPA as well.” *Id.* at 55:20–56:3; *see also id.* at 56:10–57:11 (testifying that “any good scientist” studying soybean diseases would keep track of literature in the field, including EMBRAPA publications, “[a]t any time”); *id.* at 53:9–15 (Dr. Jacobsen testifying that when he “dealt with soybean diseases extensively, [he] kept track of kind of what they did down there”).

In addition, Attachment 1b to the Hall-Ellis Declaration shows the following information, including “Library(s),” ISSN number, “Key words,” “Thesagro,” and “Final Thesaurus:”

Library(s): Embrapa Soya.

. . .

Series: (Embrapa Soy. Technical circular, 121).

ISSN: 2176-2864

Language: Portuguese

Key words: Fungus.

Thesagro: Plant disease; Fungal disease; Rust; Fungicide; Fungus; Phakopsora Pachyrhizi; Soy.

Final Thesaurus: Fungal diseases of plants; fungicides; Plant diseases and disorders; Rust diseases; Soybean rust; soybeans.

Subject category: F Plants and Products of Plant Origin

url: <https://ainfo.cnptia.embrapa.br/digital/bitstream/item/147677/1/CT-121.pdf>

Mark: [Show Complete Marc](#)

original record: Embrapa Soy (CNPSO)

Ex. 1019, Attachment 1b.

Attachment 1b also contains a link to the MARC record. *Id.* (“Mark: Show Complete Marc”). Dr. Hall-Ellis explained that MARC is a “library cataloging standard” and “[a] MARC-compatible library is one that has a catalog consisting of individual MARC records for works made available at that library.” *Id.* ¶ 27. She testified that a MARC record comprises several fields, including the title, primary author, ISSN number, and publication date of the work, as well as “fields that show information regarding subject matter classification.” *Id.* ¶¶ 33–38. Thus, we find information in Attachment 1b shows it is more likely than not that Godoy was searchable by an ordinarily skilled artisan using subject matter keywords (as those in “Final Thesaurus”).

In sum, considering all of the facts and circumstances, we find Petitioner presented sufficient evidence at the institution stage to show it is “more likely than not” that Godoy was publicly accessible to an ordinarily

skilled artisan exercising reasonable diligence before the priority date of the '727 patent. Under *Hulu*, once a petitioner meets this standard, it has additional, although “limited opportunities” to “present new evidence later,” including “in a motion to file supplemental information,” to further support its argument that a reference qualifies as a printed publication. *Hulu* 14; *see also id.* at 15 (citing cases in which the Board granted motions to submit librarian declarations as supplemental information). Petitioner’s MTSI falls squarely within this type of acceptable supplementation.

Admitting the Supplemental Hall-Ellis Declaration neither changes the grounds initially presented in the Petition nor otherwise unfairly changes the evidence underlying those grounds. Moreover, admitting the Supplemental Hall-Ellis Declaration does not unduly prejudice Patent Owner because Patent Owner had ample opportunity to cross-examine Dr. Hall-Ellis and respond to the same. Indeed, the Supplemental Hall-Ellis Declaration was filed and served on Patent Owner more than two months before the Patent Owner Response was due. *See Ex. 3001, 1*. The record also shows that, a month after receiving the Supplemental Declaration and more than a month before the Patent Owner Response was due, Patent Owner noticed the deposition of Dr. Hall-Ellis. Paper 18. According to counsel for Petitioner, the parties agreed to a date for the deposition, the date was calendared, but Patent Owner “withdrew its notice and decided not to depose her.” Tr. 16:24–25.

Under the totality of the circumstances, we grant Petitioner’s MTSI with respect to Exhibit 1022 and admit the Supplemental Declaration of Dr. Hall-Ellis into evidence in this proceeding.

B. Exhibits 1023–1029

Petitioner argues that “[a]mong the possible combinations recited in claims 1, 3, and 4 of the ’727 patent, each include the combination of: benzovindiflupyr + mancozeb + azoxystrobin.” Pet. 20. According to the Petition, Godoy discloses the same three-component combination, and thus, anticipates those claims. *Id.* (citing Ex. 1003 ¶¶ 108–114; Ex. 1005, Table 3).

In its Preliminary Response, Patent Owner argued that Petitioner fails to show Godoy discloses any treatment “consisting of” the claimed fungicides. Prelim. Resp. 25. Patent Owner pointed to footnote 1 to Table 3 of Godoy for showing “Added Nimbus 0,6 L ha-1.” *Id.* (citing Ex. 1005, Table 3). According to Patent Owner, “‘Nimbus’ is the proprietary name for pesticides containing a sulfur fungicide excluded from the ‘consisting of’ combinations claimed in the ’727 patent.” *Id.* (citing Exs. 2003–2010). Acknowledging that “Petitioner’s declarant asserts that Nimbus is a mineral oil,” Patent Owner nonetheless contended that the articles relied on by the declarant “say nothing about the contents of the Nimbus product *disclosed in Godoy*.” *Id.* at 26 (citing Ex. 1003, 41 n.3; Exs. 1017, 1018).

In the Decision to Institute, we acknowledged Patent Owner’s arguments and encouraged the parties to fully develop the record during trial on these issues. DI 17–18. In response, Petitioner seeks to enter Exhibits 1023–1029 into the record to confirm that “Nimbus, as disclosed in Godoy, is a mineral oil—not a sulfur-based fungicide.” MTSI 1, 5–6.

Exhibit 1023 is a declaration of Ryan Kody Jones, an in-house counsel at Syngenta Crop Protection, LLC. Ex. 1023 ¶ 2. Mr. Jones testifies that Exhibits 1024 and 1026 are “Syngenta trademark registrations for NIMBUS® in Brazil,” and Exhibit 1028 is the Material Safety and Data

Sheet stating “Syngenta NIMBUS® in Brazil is a mineral oil adjuvant.”

Id. ¶ 1. Exhibits 1025, 1027, and 1029 are certified English translation of Exhibits 1024, 1026, and 1028, respectively. *See* MTSI v.

We find, and Patent Owner does not dispute, that Exhibits 1023–1029 are relevant to the challenged claims, for which this trial was instituted. *See* 37 C.F.R. § 42.223(a)(2). Nonetheless, Patent Owner opposes entering Exhibits 1023–1030 into the record. MTSI Opp. 6–8. Patent Owner argues that because the Petition “entirely failed to address the scope of the ‘consisting of limitation’ or the relevance of ‘Nimbus’ thereto,” admitting Exhibits 1023–1029 would allow Petitioner to “correct errors and omissions” in the Petition. *Id.* at 6–7. We disagree.

“Nimbus,” although noted in footnote 1 of Godoy’s Table 3, is not listed in the column under the header “[a]ctive ingredient (a.i.).” Ex. 1005, Table 3. In fact, other than the table footnotes, “Nimbus” does not appear in the body of Godoy where it discusses fungicides. This fact suggests it is more likely than not that “Nimbus” is not a fungicide. As a result, it is reasonable that the Petition does not discuss “Nimbus.” Thus, we find Exhibits 1023–1029 merely respond to Patent Owner’s arguments on “Nimbus,” and do not change the scope of the instituted grounds.

At the hearing, Patent Owner complained that, because Petitioner put in the evidence showing Nimbus is mineral oil in Brazil “for the first time in [the] reply,” Patent Owner “had no opportunity to put in [its] own expert in response to. No opportunity to put in responsive evidence.” Tr. 39:1–6. We disagree. First, Petitioner did not wait to submit these Exhibits as rebuttal evidence with its Reply. Instead, Petitioner served and filed these Exhibits more than two months before the Patent Owner Response was due.

Petitioner's early submission as supplemental information provided Patent Owner with sufficient opportunity to address this issue. Second, even if Petitioner had filed them with the Reply, we would find these exhibits to be "rebuttal evidence" of the type that may be properly submitted in support of such. *See Consolidated Trial Practice Guide*⁵ ("CTPG") 73–74.

Under these circumstances, we grant Petitioner's MTSI with respect to Exhibits 1023–1029 and admit them into evidence in this proceeding.

C. Exhibit 1030

In its Preliminary Response, Patent Owner argued that the Petition failed to show Godoy discloses a "combination" of mancozeb, benzovindiflupyr, and azoxystrobin, as claimed. Prelim. Resp. 22–24 ("[R]ather than mixtures applied as a single combination, [Godoy's] protocols are based on using fungicides in separate '*associated treatments*.'").

Petitioner seeks to enter Exhibit 1030 into the record to confirm that "Godoy discloses tank-mixed fungicides." MTSI 1, 6–7. Exhibit 1030 (Machado)⁶ is a reference coauthored by Dr. Godoy and published in 2021.⁷ *See* Ex. 1030, 1. Petitioner asserts that "Machado reiterates and states that Godoy (Ex. 1004/1005) used a tank-mix." MTSI 7 (citing Ex. 1030, 2, 8).

⁵ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

⁶ Machado et al., Is tank mixing site-specific premixes and multi-site fungicides effective and economic for managing soybean rust? a metaanalysis, *Crop Protection* 151, Article 105839 (2022) (Ex. 1030, "Machado").

⁷ Despite the year 2022 in the citation, the face of the reference shows Machado was "[a]vailable online 7 October 2021." Ex. 1030, 1.

Patent Owner asserts that Exhibit 1030 is not relevant to any ground asserted by Petitioner, and thus, should not be admitted. MTSI Opp. 7–8. According to Patent Owner, because Machado was published years later, it is irrelevant to how an ordinarily skilled artisan would have read Godoy at the priority date of the challenged claims. MTSI Opp. 8. We disagree with Patent Owner.

It is undisputed that the issue of whether Godoy discloses a mixture of fungicides (e.g., in a tank-mix) as opposed to separate applications of the same is relevant to the challenged claims, at least under Patent Owner’s proposed construction of “combination” and “composition.” Machado states that Godoy evaluated mancozeb in tank mix. Ex. 1030, 2. Even though it is not prior art, Machado is probative evidence to show the state of the art at the priority date. *See Plant Genetic Sys., N.V. v. DeKalb Genetics Corp.*, 315 F.3d 1335, 1344 (Fed. Cir. 2003) (stating the district court properly used post-1987 reports “as evidence of the state of the art existing in 1987”); *In re Hogan*, 559 F.2d 595, 605 (CCPA 1977) (noting later publications may be used “as evidence of the state of the art existing on the filing date of an application”). Indeed, we note that Patent Owner itself relied on a later published, non-prior art reference to support its argument that Godoy’s “associated treatments” refers to “multiple, separately applied fungicidal applications.” Prelim. Resp. 23–24 (citing Exs. 2001, 2002⁸).

Patent Owner also complained that it “didn’t have an opportunity to put in an expert to reply” to, and “didn’t have an opportunity to put in

⁸ de Souza et al., Protective and Systemic Fungicides in the Management of *Corynespora cassiicola* in Soybeans, 5 (3) Neotropical Agriculture J. 65–69 (2018). Exhibit 2002 is the certified English translation of Exhibit 2001, which is in Portuguese.

evidence to contradict” Exhibit 1030. Tr. 36:22–25. Again, we disagree with this assertion. Petitioner served on Patent Owner and filed Exhibit 1030 more than two months before the Patent Owner Response was due. Patent Owner had sufficient opportunity to address the issue.

In sum, we find Machado is relevant to the challenged claims. We also find its admission does not change the grounds initially presented in the Petition and does not result in undue prejudice against Patent Owner. Under these circumstances, we grant Petitioner’s MTSI with respect to Exhibit 1030 and admit Machado into evidence in this proceeding.

III. ANALYSIS

A. *Principles of Law*

To prevail in this post-grant review, Petitioner “shall have the burden of proving a proposition of unpatentability by a preponderance of the evidence.” 35 U.S.C. § 326(e); 37 C.F.R. § 42.1(d).

Anticipation is a question of fact. *In re Gleave*, 560 F.3d 1331, 1334–35 (Fed. Cir. 2009). Whether a reference anticipates a claim is assessed from the perspective of an ordinarily skilled artisan. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368 (Fed. Cir. 2003). To show anticipation, each and every claim element, arranged as in the claim, must be disclosed in a single piece of prior art. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359 (Fed. Cir. 2008). But a reference can anticipate a claim even if it does not expressly spell out all the limitations arranged or combined as in the claim, if an ordinarily skilled artisan, reading the reference, would “at once envisage” the claimed arrangement or combination. *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *KSR*, 550 U.S. at 406.

A party that petitions the Board for a determination of unpatentability based on obviousness must show that “a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016) (citations omitted).

In an obviousness determination, the presence or absence of a motivation to combine references, the presence or absence of a reasonable expectation of success, as well as what a reference teaches and whether it teaches toward or away from the claimed invention, are all questions of fact. *Par Pharm., Inc. v. TWI Pharm., Inc.*, 773 F.3d 1186, 1196–97 (Fed. Cir. 2014).

The written-description inquiry is a question of fact, is context-specific, and must be determined on a case-by-case basis. *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en

banc). To satisfy the written-description requirement, the specification, within its “four corners,” must reasonably convey to those skilled in the art that the inventor had possession, “as shown in the disclosure,” of the claimed subject matter as of the filing date. *Id.* Of course, in some instances, a patentee can rely on information that is well known in the art to satisfy the written-description requirement. *Id.* (“[T]he level of detail required to satisfy the written-description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology.”).

“The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation.” *United States v. Telectronics, Inc.*, 857 F.2d 778, 785 (Fed. Cir. 1988). Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). These factors include, for example, the nature of the invention, the state of the prior art, the level of one of ordinary skill, the level of predictability in the art, and the amount of direction provided by the inventor. *Id.*

We analyze the instituted grounds of unpatentability in accordance with these principles.

B. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995).

Furthermore, the prior art itself can reflect the appropriate level of ordinary skill in the art. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

Petitioner asserts that an ordinarily skilled artisan at the priority date of the '727 patent

would have at least a Bachelor's degree in plant biology or plant pathology with several years of practical experience in plant pathology, or alternatively, an advanced degree (Masters or Ph.D) in the fields of plant biology or plant pathology, or a related field, with several years of practical experience in the industry within these fields.

Pet. 18 (citing Ex. 1003 ¶¶ 71–72).

Patent Owner does not dispute Petitioner's proposed definition of the skill level. PO Resp. 5. It, however, adds that "a POSA would also have been familiar with pesticide label development and/or registration and would have had experience in making pest management recommendations to growers. *Id.* (citing Ex. 2020 ¶¶ 1, 13–40, 68–69).

After reviewing the record, we adopt Petitioner's definition as modified with Patent Owner's addition because it is consistent with the prior art's demonstration of the level of ordinary skill in the art at the time of the invention.

C. Claim Construction

In a post-grant review, we construe a claim term "using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b)." 37 C.F.R. § 42.200(b). Under this standard, we construe the claim "in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent." *Id.*; *see also Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc)

(holding that the words of a claim “are generally given their ordinary and customary meaning,” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application”).

Other than noting that the terms “composition” and “combination” are “used interchangeably in the specification,” the Petition does not include any express claim construction. Pet. 18 (citing Ex. 1003 ¶ 76). In its Response, Patent Owner proposes that we construe the terms “fungicidal combination,” “combination,” and “composition,” as well as “consisting of.” PO Resp. 5–8.

Before discussing these terms below, we address Patent Owner’s contention that because the Petition does not include any express claim construction, Petitioner is “precluded from offering new reply evidence or argument on these points.” *See* Sur-reply 1–2. We disagree with Patent Owner.

The Federal Circuit has instructed that

where a patent owner in an IPR first proposes a claim construction in a patent owner response, a petitioner must be given the opportunity in its reply to argue and present evidence of anticipation or obviousness under the new construction, at least where it relies on the same embodiments for each invalidity ground as were relied on in the petition.

Axonics, Inc. v. Medtronic, Inc., 75 F.4th 1374, 1384 (Fed. Cir. 2023); *see also Parkervision, Inc. v. Vidal*, 88 F.4th 969, 979–80 (Fed. Cir. 2023) (“Because the Board’s institution decision did not contain an express claim construction, the [Administrative Procedure Act] APA required the Board to give [the petitioner] adequate notice and an opportunity to respond under the new construction first proposed in [the] patent owner response.”) (quotation

marks omitted). Thus, under *Parkervision* and *Axonics*,⁹ Petitioner may properly respond to Patent Owner’s proposed claim construction at the reply stage, as it has done here.

We now turn to the substantive discussion of the claim construction.

1. “Fungicidal Combination,” “Combination,” and “Composition”¹⁰

Patent Owner contends that the terms “combination” (or “fungicidal combination”) and “composition” should be construed “to mean that the recited fungicides are together in a single mixture (e.g., as a pre-mix or tank-mix), distinct from applying one or more of them sequentially.”

PO Resp. 5 (citing Ex. 2020 ¶¶ 78–81). Patent Owner argues that, at the very least, the term “composition” would be understood as “mixed.” *Id.* n.1.

According to Patent Owner, this proposed construction is consistent with how an ordinarily skilled artisan “would understand the terms in the art, generally,” and also consistent with the ’727 patent specification. *Id.* at 5–6 (citing Ex. 1001, 19:54–60, 21:15–21; Ex. 1006, 27:55–64;¹¹ Ex. 2020 ¶¶ 73–77; Ex. 2021, 82:6–83:22).

⁹ Although each of *Parkervision* and *Axonics* involves *inter partes* review, the Federal Circuit’s instruction that the APA requires that a petitioner be given an opportunity to respond to claim constructions first proposed in the patent owner response is equally applicable to post-grant review, such as the instant proceeding.

¹⁰ Both sides agree that these terms should be construed collectively. *See* Pet. 18 (Petitioner arguing that the terms “composition” and “combination” are “used interchangeably in the specification”); PO Resp. 5 (Patent Owner proposing the construction for these terms together).

¹¹ Here, Patent Owner appears to cite Tobler as supporting its proposed construction of “composition.” Prelim. Resp. 6 (citing “EX1006, 27:55–64 (defining composition)”). Elsewhere, however, Patent Owner asserts that Tobler’s definition of “compositions” is “non-standard.” PO Resp. 23; Sur-reply 14, 17. In fact, Patent Owner argues that “Petitioner does not

Petitioner counters that the language of the '727 patent specification that Patent Owner relies on does not require that the components be mixed before spraying and does not exclude a combination formed by the sequential application of the fungicides to the same plants. Reply 2 (citing Ex. 1001, 19:54–60). We find Petitioner's argument persuasive.

The '727 patent states that

[t]he combinations of the present invention *may* be sold as a pre-mix composition or a kit of parts such that individual actives *may* be mixed before spraying. Alternatively, the kit of parts may contain succinate dehydrogenase inhibitor fungicide and the dithiocarbamate fungicide pre-mixed and the third active may be admixed with an adjuvant such that the two components *may* be tank mixed before spraying.

Ex. 1001, 19:54–60 (emphases added).

In the Sur-reply, Patent Owner contends that this excerpt is addressing “alternative *sales formats*,” and does not redefine the claimed “combination” and “composition.” Sur-reply 3. We find this argument unavailing because it was Patent Owner who first relied on this exact paragraph to support its proposed construction, urging that this text excludes sequential application of component fungicides. *See* PO Resp. 5–6 (citing Ex. 1001, 19:54–60). In any event, the repeated usage of the word “may” suggests that although pre-mix or tank-mix of the individual actives is contemplated, it is not required, for the claimed “combination.”

Moreover, contrary to Patent Owner's argument, the '727 patent specification shows the term “composition” does not require that “the recited

address purported anticipation in light of Tobler's express definition of ‘composition.’” PO Resp. 36. We address that argument below. *See infra* Section III.E.2.

fungicides are together in a single mixture.” *See* PO Resp. 5 & n.1. Instead, as Petitioner correctly points out, the ’727 patent explicitly discloses that “the composition of the present invention maybe [*sic*] applied simultaneously as a tank mix or a formulation or **may be applied sequentially**.” Reply 3 (quoting Ex. 1001, 19:61–63, emphasis added by Petitioner).

Relying on Dr. Jacobsen’s testimony, Patent Owner argues that “the [’727] Patent’s discussion of ‘sequential’ applications is teaching that *compositions* (EX1001, 19:54-60) ‘may be applied at various stages of the crop cycle.’” Sur-reply 3–4 (citing Ex. 2020 ¶ 72).¹² We are not persuaded by this argument.

As an initial matter, paragraph 72 of the Jacobsen Declaration does not support Patent Owner’s argument because it does not mention “stages of the crop cycle” or otherwise purport to address the specification’s teaching regarding sequential application. *See* Ex. 2020 ¶ 72 (Dr. Jacobsen testifying only that the ’727 patent “uses the term ‘mixed’ to describe fungicidal combinations”) (citing Ex. 1001, 21:15–20).

More importantly, even if paragraph 72 or other portions of the Jacobsen Declaration supported Patent Owner’s argument, we would give such extrinsic evidence limited weight because it is at odds with the intrinsic evidence, as further explained below. *See Phillips*, 415 F. 3d at 1318.

¹² Patent Owner also cites “POR, 5–6” to support this argument. Sur-reply 4. Putting aside that one argument cannot be supported by another argument, or that our Rule does not allow incorporating arguments by reference from one document into another document (37 C.F.R. § 42.6(a)(3)), pages 5 and 6 of the Patent Owner Response do not mention “stages of the crop cycle.”

The full text of the relevant specification passage of the '727 patent provides:

The composition of the present invention maybe [*sic*] applied simultaneously as a tank mix or a formulation or may be applied sequentially. The application may be made to the soil before emergence of the plants, either pre-planting or post-planting. The application may be made as a foliar spray at different timings during crop development, with either one or two applications early or late post-emergence.

Ex. 1001, 19:61–67.

Relying on the '727 patent's discussion of applications at different times (pre- or post- emergence, and early or late post-emergence) in the second and third sentences above, Patent Owner argues that sequential application in the first sentence means “applying the entire composition multiple times.” Tr. 45:21–23. But Patent Owner points to no evidence, and we find none, to support its argument that “applied sequentially” means repeated application of a premixture of the recited fungicides. Instead, the first sentence of the passage above expressly juxtaposes applying the composition “simultaneously” (e.g., in a “tank mix”) with applying it “sequentially.” We agree with Petitioner that “[l]ogically, if ‘simultaneously’ refers to ‘tank mix or a formulation’ then ‘sequentially’ refers to separate applications of fungicides.” Reply 3. Thus, read in context, the first sentence above describes *how* the composition may be applied, i.e., either simultaneously or by sequential application of the component fungicides, whereas the second and third sentences describe *when* that simultaneous or sequential application may occur. In sum, the '727 patent specification confirms our interpretation that the term “composition” does not exclude a composition formed by sequential application of component fungicides.

Quoting language from a Federal Circuit case, Patent Owner argues that “[t]he term ‘composition’ in chemistry is well-established. It generally refers to mixtures of substances,” and the terms “‘composition,’ ‘mixture,’ ‘combination,’ and ‘conjunction . . . all mean essentially the same thing.’” PO Resp. 6 (quoting *PIN/NIP, Inc. v. Platte Chemical Co.*, 304 F.3d 1235, 1244 (Fed. Cir. 2002)). We are not persuaded by this argument either.

In *PIN/NIP*, the Federal Circuit has explained that the construction of a term in a patent claim is a highly contextual exercise that is dependent upon the content of the particular patent in which the term appears, and one cannot always apply the construction of a claim term from one patent to an unrelated patent in an unrelated lawsuit. 304 F.3d at 1244. Here, the ’727 patent explicitly discloses that the composition of its invention “may be applied sequentially” as opposed to only “simultaneously as a tank mix or a formulation.” Ex. 1001, 19:61–63. In view of this unequivocal statement, we agree with Petitioner that an ordinarily skilled artisan would have understood that the claimed “composition” does not exclude a composition formed by applying the component fungicides sequentially. *See* Reply 3 (citing Ex. 1003 ¶¶ 76–77). This determination as to the scope of “composition” is sufficient for purposes of this Decision, and we need not further address the term.

2. “Consisting of”

Patent Owner argues that the term “consisting of” should be construed according to its legal meaning so that “the claimed combinations include the recited fungicide components and no other fungicides.” PO Resp. 8 (citing

Ex. 2020 ¶¶ 82, 83). We agree, and Petitioner does not dispute, that the term “consisting of” means “no other fungicides.”¹³ Reply 3–4.

Claim terms need only be construed to the extent necessary to resolve the controversy. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011). On this record and for purposes of this Decision, we see no need to address the construction of any other claim term.

D. Alleged Anticipation by Godoy

Petitioner asserts Godoy anticipates claims 1, 3–5, 7, 9, and 10 of the '727 patent. Pet. 19–27. Petitioner provides detailed analysis, mapping each claim limitation to the disclosures of Godoy. *Id.* After reviewing the entire record developed at trial, and as explained below, we determine that Petitioner has shown, by a preponderance of the evidence, that Godoy qualifies as prior art and discloses all limitations as arranged in the challenged claims.

1. Disclosure of Godoy

Godoy summarizes the results of cooperative trials conducted in Brazil to evaluate the efficiency of multisite fungicides in controlling Asian soybean rust. Ex. 1005, 1. The trials involve two protocols: the first one “with the isolated multisite fungicides,” and “the second one with the products used in association with the fungicides picoxystrobin + cyproconazole 60 + 24 g a.i. ha⁻¹ (Approach®Prima, DuPont) and azoxystrobin + benzovindiflupyr 60 + 30 g a.i. ha⁻¹ (Elatus®, Syngenta).” *Id.* at 2.

¹³ Petitioner, however, contends that “as applied by [Patent Owner] UPL, the claim interpretation would appear to exclude the use of the *adjuvant* mineral oil.” Reply 4. We address this argument below. *See infra* Section III.D.3.

Table 3 lists twenty-three “associated treatments” showing “[a]ctive ingredients (a.i.), commercial product (C.P.) and dose of fungicides evaluated.” *Id.* at 3. The active ingredients in treatments 17 and 23 are “azoxystrobin + benzovindiflupyr and mancozeb.” *Id.* Godoy reports that “[f]or applications associated with fungicide azoxystrobin + benzovindiflupyr 60 + 30 g a.i. ha⁻¹, the highest productivities were observed for treatments with associations of mancozeb 1500 g a.i. ha⁻¹ and 2000 g a.i. ha⁻¹.” *Id.* at 5.

2. Godoy’s Prior-Art Status

Patent Owner argues that Petitioner has failed to establish that Godoy is prior art. PO Resp. 8–15. Patent Owner focuses on the Petition and the original Hall-Ellis Declaration. *Id.* As explained above, for purposes of institution, Petitioner met its burden to show it is more likely than not that Godoy qualifies as prior art. *See supra* Section II.A. To prevail in this post-grant review, however, Petitioner must meet the preponderance of the evidence standard. *See* 35 U.S.C. § 326(e). For the reasons explained below, we find Petitioner has also met this higher burden to show Godoy qualifies as prior art.

First, the front page of Godoy bears the date of “August 2016.” Ex. 1005, 1. Petitioner also points to a June 7, 2019 affidavit submitted by Dr. Oliveira, an employee of Patent Owner, in support of an application before the Indian Patent Office.¹⁴ Reply 13 (citing Ex. 1038, 151). In that affidavit, Dr. Oliveira stated that “Paper 16 [Godoy] was published

¹⁴ Petitioner represents, and Patent Owner does not dispute, that this Indian application claims priority to Exhibit 1007 (Oliveira), one of the prior art references asserted in this proceeding. Reply 19; Ex. 1043, 79:19–80:1.

August 2016.” Ex. 1038, 151; *see also id.* at 168 (showing the date and signature), 643 (showing “Paper 16” is Godoy). Dr. Oliveira later repeated the same statement that “Paper 16 [Godoy] was published August 2016” in another affidavit submitted to the Indian Patent Office. Ex. 1035, 59. It is worth noting that this second affidavit was executed less than a year ago, on August 7, 2023 (Ex. 1035, 178), and after the institution of this proceeding on July 31, 2023.

Second, as explained above, Attachment 1b of Hall-Ellis Declaration contains a link to the MARC record. *See* Ex. 1019, Attachment 1b (“Mark: Show Complete Marc”). In her Supplemental Declaration, Dr. Hall-Ellis testifies that the full MARC record shows “Godoy has been available as of *at least* September 22, 2016—if not earlier.” Ex. 1022 ¶¶ 19–25. We find this testimony credible. *See id.*, Attachment 3 (showing “005 2016-09-22”); ¶ 22 (explaining that “when a MARC record is created by a library for its own copy of a work, field 005 is automatically populated with the date that MARC record was created”).

Dr. Hall-Ellis also testifies that the full MARC record shows “the Godoy report was properly cataloged for accessibility.” Ex. 1022 ¶¶ 26–28. We find this testimony credible too. *See id.*, Attachment 3 (showing terms including “Fungal diseases of plants,” “Fungicides,” “Plant diseases and disorders,” “Rust diseases,” “Soybean rust” in the 650 field); ¶ 27 (quoting Library of Congress’s explanation that the 650 field is a “[s]ubject added entry in which the entry element is a topical term” and these entries “are assigned to a bibliographic record to provide access according to generally accepted thesaurus-building rules”). We note these terms are the same in the

“Final Thesaurus” field in Attachment 1b to the original Hall-Ellis Declaration. *See* Ex. 1019, Attachment 1b.

Third, Dr. Hall-Ellis provides other evidence, such as the Dublin Core record (Ex. 1022, Attachments 5, 6) and the *ResearchGate* page (*id.*, Attachments 7–10), to further support her opinion that the Godoy report was publicly available before November 4, 2016. *Id.* ¶¶ 31–38, 42–48.

She testifies that “*ResearchGate* contains many search features which would allow an interested POSA to find the Godoy report, e.g., key word searching.” *Id.* ¶ 48. Dr. Jacobsen, who has personally used the service, agrees that in *ResearchGate*, “you can start to search for publications using keywords and things like that, authors.” Ex. 1043, 66:1–67:10. For these reasons, we again find Dr. Hall-Ellis’s testimony credible.

After considering all the facts and circumstances surrounding Godoy, we are persuaded that Petitioner has shown, by a preponderance of the evidence, that before November 4, 2016, Godoy was publicly available so that an ordinarily skilled artisan, exercising reasonable diligence, could locate it. *See Jazz Pharms.*, 895 F.3d at 1355. As a result, we find Godoy qualifies as prior art to the ’727 patent.

3. Nimbus

Patent Owner asserts that Petitioner has failed to establish that Godoy meets the “consisting of” limitation because “[e]very Godoy two- and three-component associated treatment relied upon by Petitioner includes ‘Nimbus’ added to the Elatus® (benzovindiflupyr + azoxystrobin) product.” PO Resp. 19–20. We disagree.

First, Petitioner relies on Table 3 of Godoy to show the disclosure of “the combination of benzovindiflupyr + mancozeb + azoxystrobin.” Pet. 20

(citing Ex. 1005, Table 3). Table 3, as annotated by Petitioner, is reproduced below:

Table 3. Active ingredients (a.i.), commercial product (C.P.) and dose of fungicides evaluated in associated treatments to control diseases in soybean crops, 2015/16 harvest.

Active ingredient (a.i.)	Dose g a.i. ha ⁻¹	Commercial product (C.P.)	Dose l-kg C.P. ha ⁻¹
1 control	-	Control	-
2 picoxystrobin + cyproconazole ¹	60+24	Aproach ¹ Prima	0.3
3 picoxystrobin + cyproconazole ¹ and copper oxychloride	60+24 and 294	Aproach ¹ Prima and Difere ¹	0.3 and 0.5
4 picoxystrobin + cyproconazole ¹ and chlorothalonil	60+24 and 1080	Aproach ¹ Prima and Previnil ¹	0.3 and 1.5
5 picoxystrobin + cyproconazole ¹ and copper oxychloride	60+24 and 280	Aproach ¹ Prima and PNR ²	0.3 and 0.4
6 picoxystrobin + cyproconazole ¹ and mancozeb	60+24 and 1500	Aproach ¹ Prima and Unizeb Gold ¹	0.3 and 2.0
7 picoxystrobin + cyproconazole ¹ and copper sulfate	60+24 and 113,85	Aproach ¹ Prima and PNR ²	0.3 and 0.75
8 picoxystrobin + cyproconazole ¹ and propineb	60+24 and 1400	Aproach ¹ Prima and PNR ²	0.3 and 2.0
9 picoxystrobin + cyproconazole ¹ and fluazinam	60+24 and 500	Aproach ¹ Prima and Frownicide/Zignal ¹	0.3 and 1.0
10 picoxystrobin + cyproconazole ¹ and chlorothalonil	60+24 and 1000	Aproach ¹ Prima and Bravonil 500 [®]	0.3 and 2.0
11 picoxystrobin + cyproconazole ¹ and chlorothalonil	60+24 and 1000	Aproach ¹ Prima and PNR ²	0.3 and 2.0
12 picoxystrobin + cyproconazole ¹ and mancozeb	60+24 and 2000	Aproach ¹ Prima and PNR ²	0.3 and 2.5
13 azoxystrobin + benzovindiflupyr ¹	60+30	Elatus ¹	0.2
14 azoxystrobin + benzovindiflupyr ¹ and copper oxychloride	60+30 and 294	Elatus ¹ and Difere ¹	0.2 and 0.5
15 azoxystrobin + benzovindiflupyr ¹ and chlorothalonil	60+30 and 1080	Elatus ¹ and Previnil ¹	0.2 and 1.5
16 azoxystrobin + benzovindiflupyr ¹ and copper oxychloride	60+30 and 280	Elatus ¹ and PNR ²	0.2 and 0.4
17 azoxystrobin + benzovindiflupyr ¹ and mancozeb	60+30 and 1500	Elatus ¹ and Unizeb Gold ¹	0.2 and 2.0
18 azoxystrobin + benzovindiflupyr ¹ and copper sulfate	60+30 and 113,85	Elatus ¹ and PNR ²	0.2 and 0.75
19 azoxystrobin + benzovindiflupyr ¹ and propineb	60+30 and 1400	Elatus ¹ and PNR ²	0.2 and 2.0
20 azoxystrobin + benzovindiflupyr ¹ and fluazinam	60+30 and 500	Elatus ¹ and Frownicide/Zignal ¹	0.2 and 1.0
21 azoxystrobin + benzovindiflupyr ¹ and chlorothalonil	60+30 and 1000	Elatus ¹ and Bravonil 500 [®]	0.2 and 2.0
22 azoxystrobin + benzovindiflupyr ¹ and chlorothalonil	60+30 and 1000	Elatus ¹ and PNR ²	0.2 and 2.0
23 azoxystrobin + benzovindiflupyr ¹ and mancozeb	60+30 and 2000	Elatus ¹ and PNR ²	0.2 and 2.5

¹ Added Nimbus 0,6 L ha⁻¹; ² PNR – Product not registered for the soybean crop, RET III.

Table 3 of Godoy shows “[a]ctive ingredients (a.i.), commercial product (C.P.) and dose of fungicides evaluated in associated treatments to control diseases in soybean crops.” Ex. 1005, Table 3. For combinations 17 and 23, which Petitioner highlights in the table above, azoxystrobin + benzovindiflupyr + mancozeb are listed in the column under the header “[a]ctive ingredient (a.i.),” whereas Nimbus is not. *Id.* Instead, it only appears in the footnote. *Id.* This distinction supports the conclusion that Nimbus is not itself an active ingredient. It is also consistent with Petitioner’s explanation that Nimbus, as disclosed in Godoy, refers to an inert mineral oil adjuvant as opposed to a fungicide. *See* Reply 17–18.

Second, according to Patent Owner, “‘Nimbus’ is the proprietary name of multiple commercial fungicidal products, in particular mineral oil and sulfur products.” PO Resp. 20–21 (citing Ex. 2020 ¶¶ 119–120; Ex. 2003–2010¹⁵). The evidence Patent Owner relies on shows “Nimbus” is registered in Australia (Exs. 2003, 2004), Spain (Exs. 2006, 2008), and Portugal (Ex. 2010) as a sulfur-based fungicide for the control of powdery mildew, rust, and mites in various fruit and vegetable crops. *See* Ex. 2003, 1; Ex. 2004, 1–2; Ex. 2008, 2–5; Ex. 2010, 3–5. It does not appear that soybean is listed as one of those crops. *See id.*

It is undisputed that Godoy is a Brazilian publication reporting soybean disease control research conducted in Brazil. Petitioner presents sufficient evidence to support its argument that, at least in Brazil, “Nimbus” was known to refer to a mineral oil adjuvant as opposed to a sulfur-based fungicide. Reply 18 (citing Exs. 1023–1029¹⁶).

Third, Patent Owner contends that even if Godoy’s “Nimbus” is just mineral oil, at the concentrations used in Godoy, that mineral oil is fungicidally active, and thus, Godoy’s composition would not meet the “consisting of” limitation. Sur-reply 9–10 (citing Ex. 2020 ¶¶ 121–131, Ex. 2039, Ex. 2059, Ex. 2021 (cross-examination testimony from Dr. Brannen), 46:17–49:14). We are not persuaded by this argument.

Exhibit 2039 evaluates the effect of mineral oil, among others, for the control of yellow Sigatoka leaf spot of bananas. Ex. 2039, 379. Exhibit 2059

¹⁵ Exhibits 2006, 2008, and 2010 are certified English translation of Exhibits 2005, 2007, and 2009, respectively. Paper 55, 1–2.

¹⁶ Exhibits 1025, 1027, and 1029 are certified English translation of Exhibits 1024, 1026, and 1028, respectively. Paper 56, iv.

discusses control of powdery mildew on leaves and stems of gooseberry. Ex. 2059, 365. Dr. Jacobsen also relies on Exhibit 2022, which discusses effectiveness of plant oil and mineral oil in the control of pelargonium rust. Ex. 2020 ¶ 125; Ex. 2022, 193. None of these exhibits mentions applying mineral oils as fungicides on soybean crop.

Furthermore, Dr. Jacobsen testifies that Exhibit 2022 “reported in 2015 that mineral oils had fungicidal activity at concentrations as low as 0.25%.” Ex. 2020 ¶ 128 (citing Ex. 2022, Table 2). Exhibit 2022, however, is a 2005 publication and does not include the Table 2 Dr. Jacobsen relies on. *See generally* Ex. 2022; *see also* Ex. 1043, 140:13–141:15 (counsel for Patent Owner acknowledging that the publication Dr. Jacobsen relies on to support his opinion in paragraph 128 of the Declaration was not produced, and thus, not of record of this case).

In any event, Dr. Jacobsen conceded during his deposition that “to compare two different applications of mineral oil against each other[,] you would need to know both the application rate and the concentration.” Ex. 1043, 148:2–6, 149:17–21. Dr. Jacobsen testified that Table 2 in paragraph 128 of his Declaration only shows the concentration of the mineral oils (e.g., 0.25%) (*id.* at 145:1–2), whereas Godoy only shows the application rate for Nimbus (Ex. 1005, 3 (“Added Nimbus 0,6 l ha-”)). In view of these inconsistencies, we do not find Dr. Jacobsen’s testimony (Ex. 2020 ¶ 128) and the exhibits Patent Owner cites sufficiently show that the Nimbus noted in Godoy would have had fungicidal activity.

Dr. Brannen’s testimony does not support Patent Owner’s argument either. Dr. Brannen testified about testing mineral oil applied in addition to fungicides for control of peach scab, not soybean rust. Ex. 2021,

46:17–49:14. According to Dr. Brannen, in those tests, although the addition of mineral oil “increased the performance of the fungicide,” “[t]he oil, relative to control, did not provide particularly good efficacy by comparison to oil with a fungicide,” and there was no “statistical difference at all between the oil itself and the untreated control.” *Id.* Dr. Brannen further testified that “[i]t is possible that an oil by itself can have an effect on a fungus, but it can be a negative effect as well. In a sense, you can actually increase disease sometimes by applying oils.” *Id.* at 49:11–14. Thus, the cross-examination testimony Patent Owner identifies is more consistent with Petitioner’s argument that mineral oil is an inert adjuvant than it is with Patent Owner’s arguments to the contrary.

Fourth, Petitioner presents evidence showing “mineral oil based Nimbus™” is a “commercially available tank mix adjuvant[]” applied with a fungicide to soybean plant. *See* Ex. 1041 ¶¶ 8, 66–67 (showing applying cyproconazole with Nimbus to “soya, Williams’s variety”). In addition, Nimbus was applied at the same application rate therein as in Godoy. *Compare id.* ¶ 67 (“All treatments included Nimbus™ at a rate of 600 ml/ha”), with Ex. 1005, 3 (“Added Nimbus 0,6 l ha-”); *see also* Ex. 1043, 162:7–163:11 (Dr. Jacobsen’s testimony on Exhibit 1041). Petitioner further presents evidence showing that Nimbus, a standard adjuvant, does not have fungicide effect. *See* Ex. 1042 ¶ 41, Tables 1–4; *see also* Ex. 1043, 163:15–166:18 (Dr. Jacobsen’s testimony on Exhibit 1042).

Weighing the evidence presented by both parties, we find Petitioner has shown, by a preponderance of the evidence, that the Nimbus disclosed in Godoy was a mineral oil adjuvant, and not an additional fungicide.

4. “Combination” or “Composition”

Patent Owner argues that Petitioner has failed to establish that Godoy discloses the claimed “combination” or “composition.” PO Resp. 15–19. Patent Owner contends that Godoy discloses “associated treatments,” “applications associated,” “association[s] with,” and “associated application[s].” *Id.* at 15 (citing Ex. 1005, 4–6) (emphases omitted). According to Patent Owner, “a POSA would understand Godoy’s ‘associated treatments’ to describe multiple fungicides applied *sequentially*—not as mixed combinations or compositions—to the same crop at different times.” *Id.* at 16–17 (citing Ex. 2020 ¶ 100). Thus, Patent Owner concludes, Godoy does not disclose the claimed “combination” or “composition,” which under Patent Owner’s proposed construction, requires “the recited fungicides are together in a single mixture.” *Id.* at 5, 15.

As explained above, we reject Patent Owner’s proposed construction of “combination” and “composition” as excluding sequential application. *See supra* Section III.C.1. Instead, as Petitioner correctly points out, the ’727 patent explicitly discloses that “the composition of the present invention maybe [*sic*] applied simultaneously as a tank mix or a formulation or **may be applied sequentially**.” Reply 3 (quoting Ex. 1001, 19:61–63, emphasis added by Petitioner).

Thus, Godoy discloses a “combination” or “composition” even under Patent Owner’s interpretation of Godoy’s “associated treatments” because the ’727 patent explicitly discloses that its “composition” may be applied sequentially.

5. Anticipation by Godoy

Petitioner asserts Godoy anticipates claims 1, 3–5, 7, 9, and 10 of the ’727 patent. Pet. 19–27. We focus our analysis on claim 1.

Claim 1 is directed to a fungicidal combination consisting of benzovindiflupyr, mancozeb, and at least another fungicide selected from a Markush group of thirty-six ergosterol biosynthesis inhibitor fungicides and a Markush group of nineteen quinone outside inhibitor fungicides. Ex. 1001, 21:40–62. Petitioner argues that claim 1 encompasses the combination of benzovindiflupyr + mancozeb + azoxystrobin, and Godoy discloses this combination, and thus, anticipates claim 1. Pet. 19–20 (citing Ex. 1003 ¶¶ 108–114; Ex. 1005, 3). We find Petitioner’s argument persuasive.

Godoy evaluates the efficiency of multisite fungicides, “isolated and associated,” in controlling Asian soybean rust. Ex. 1005, 1–2. Two of the “associated treatments,” i.e., combinations 17 and 23 in Table 3, consist of the active ingredients “azoxystrobin + benzovindiflupyr and mancozeb.” *Id.* at 3. As explained above, Godoy discloses a “combination” or “composition” even if its “associated treatments” are limited to sequential applications.¹⁷ *See supra* Section III.D.4. Also as explained above, Petitioner has shown, by a preponderance of the evidence, that Nimbus in Godoy is not a fungicide. *See supra* Section III.D.3. Thus, even though Nimbus was added to azoxystrobin + benzovindiflupyr, the “azoxystrobin + benzovindiflupyr and mancozeb” combinations disclosed in Godoy still meet the “consisting of” limitation. Because Petitioner has shown, by a preponderance of the evidence, that Godoy discloses each limitation as arranged in claim 1, we find Godoy anticipates claim 1.

¹⁷ Record evidence shows that Godoy evaluated mancozeb in tank mix. *See* Ex. 1030, 2. Thus, our anticipation finding for this ground would be the same even under Patent Owner’s construction of “combination” or “composition.”

Petitioner also maps each limitation of claims 3–5, 7, 9, and 10 to the disclosures of Godoy. Pet. 19–27. Patent Owner does not make separate arguments to address these claims apart from what we addressed above for claim 1. *See* PO Resp. 8–22; Sur-reply 5–13. After reviewing the entire record developed at trial, we find Petitioner’s analysis persuasive and adopt it as our own.

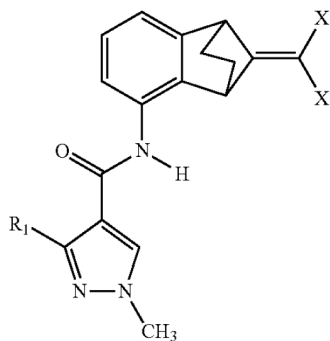
In sum, Petitioner has shown, by a preponderance of the evidence, that Godoy qualifies as prior art and discloses each limitation of the challenged claims as arranged therein. Thus, we determine Petitioner demonstrates by a preponderance of the evidence that Godoy anticipates claims 1, 3–5, 7, 9, and 10.

E. Alleged Anticipation by Tobler

Petitioner contends that Tobler anticipates claims 1 and 3–10. Pet. 27–34, 36–50. Petitioner provides detailed analysis, mapping each claim limitation to the disclosures of Tobler. *Id.* After reviewing the entire record developed at trial, and as explained below, we determine that Petitioner has shown, by a preponderance of the evidence, that Tobler anticipates claims 1 and 3–10.

1. Disclosure of Tobler

Tobler states that, to meet the “needs of agricultural practice for increased crop tolerance and/or increased activity against phytopathogenic fungi, such as *Phakopsora pachyrhizi*,” which causes Asian soybean rust, its invention provides a novel composition suitable for control of diseases caused by phytopathogens. Ex. 1006, 1:34–39. Tobler discloses its composition to comprise (A) a compound of formula I, as depicted by the chemical structure below



wherein R₁ is difluoromethyl or trifluoromethyl and X is chloro, fluoro or bromo; and (B) at least one compound selected from the group consisting of a strobilurin fungicide, an azole fungicide, and others. *Id.* at 1:40–64.

Tobler discloses that a preferred compound of formula (I) is “3-difluoromethyl-1-methyl-1H-pyrazole-4-carboxylic acid (9-dichloromethylidene-benzonorbornene-5-yl)amide (compound A-1.1).” *Id.* at 13:9–11. Petitioner asserts, and Patent Owner does not dispute, that compound A-1.1 is benzovindiflupyr. Pet. 28. Tobler presents leaf disc test data to show the action of compound A-1.1 against Asian soybean rust. Ex. 1006, 41:5–30.

Tobler discloses that compounds in group P are “Especially Suitable Compounds as Component (B)” in its compositions. *Id.* at 22:61–62. Compounds in group P include, among others,

a strobilurin fungicide selected from azoxystrobin (47), dimoxystrobin (226), fluoxastrobin (382), kresoxim-methyl (485), metominostrobin (551), orysastrobin, picoxystrobin (647), pyraclostrobin (690); trifloxystrobin (832), a compound of formula B-1.1

[formula B-1.1]

an azole fungicide selected from azaconazole (40), bromuconazole (96), cyproconazole (207), difenoconazole (247), diniconazole (267), diniconazole-M (267), epoxiconazole (298), fenbuconazole (329), fluquinconazole (385), flusilazole

(393), flutriafol (397), hexaconazole (435), imazalil (449), imibenconazole (457), ipconazole (468), metconazole (525), myclobutanil (564), oxpoconazole (607), pefurazoate (618), penconazole (619), prochloraz (659), propiconazole (675), prothioconazole (685), simeconazole (731), tebuconazole (761), tetraconazole (778), triadimefon (814), triadimenol (815), triflumizole (834), triticonazole (842), diclobutrazol (1068), etaconazole (1129), furconazole (1198), furconazole-cis (1199) and quinconazole (1378);

....

Id. at 22:63–23:25.

In Tobler, “especially preferred compositions” comprise compound A-1.1 (i.e., benzovindiflupyr) as component (A) and “as component (B) a compound selected from azoxystrobin, picoxystrobin, bixafen, fludioxonil, fenpropidin, fenpropimorph, fluopyram, difenoconazole, tebuconazole, ipconazole, cyprodinil, mandipropamid, chlorothalonil, cyproconazole, prothioconazole, propiconazole and epoxiconazole.” *Id.* at 13:50–14:6.

According to Tobler, its compositions “may also comprise more than one of the active components (B)” to, for example, broaden of the spectrum of phytopathogenic disease control. *Id.* at 27:65–28:1. Tobler states that “it may be advantageous in the agricultural practice to combine two or three components (B) with component (A). An example is a composition comprising a compound of formula (I), azoxystrobin and cyproconazole.” *Id.* at 28:1–5.

Tobler further discloses embodiments E1 and E2 with compositions comprising three active ingredients. *Id.* at 28:6–8. Specifically, an E1 composition is “mancozeb+TX1.” *Id.* at 28:40. Tobler defines TX1 to mean “the compound A-1.1+a compound selected from the group P.” *Id.* at 28:10–11.

2. Claim 1

a. *Summary of the Parties' Arguments*

A subgenus of claim 1 includes fifty-five three-component combinations: benzovindiflupyr, mancozeb, and a third component selected from fifty-five other fungicides.¹⁸ Petitioner contends Tobler anticipates claim 1 because it specifically discloses Embodiment E1 “mancozeb+TX1,” which corresponds to the combination “Mancozeb+ benzovindiflupyr+ (group P component).” Pet. 30–31 (citing Ex. 1006, 28:6–8, 28:10–11, 28:40). Petitioner asserts that Tobler’s group P includes forty-seven of the fifty-five fungicides recited in claim 1. *Id.* at 31–32 (citing Ex. 1006, 22:61–25:67; Ex. 1003 ¶¶ 138–144). According to Petitioner, “[t]he substantial overlap with the group P demonstrates the ease with which a POSA would envisage⁴⁷ of the 55 possible third components when making the claimed combinations.” *Id.* at 32 (citing Ex. 1003 ¶¶ 142–144). As a result, Petitioner argues Tobler anticipates claim 1. *Id.*

Patent Owner counters that Petitioner “fails to establish that Tobler discloses the invention as arranged in the claims. Instead, it relies on ‘picking and choosing’ from multiple lists within Tobler in an effort to reconstruct the claims.” PO Resp. 24. According to Patent Owner, to arrive

¹⁸ Claim 1 is directed to a fungicidal combination consisting of benzovindiflupyr, mancozeb, and “at least another” fungicide selected from two Markush groups totaling fifty-five fungicides. Ex. 1001, 21:40–62. Because of the “at least another” language, claim 1 includes not only fifty-five three-component combinations (i.e., select one from the fifty-five), but also thousands of four-component combinations (i.e., select two from the fifty-five), tens of thousands of five-component combinations (i.e., select three from the fifty-five), and so on so forth. In other words, claim 1 encompasses a large genus of fungicide combinations.

at Petitioner’s asserted embodiment purportedly covered by the claims, an ordinarily skilled artisan would have to (1) select embodiment E1 over embodiment E2; (2) select “mancozeb+TX1” from among a list of 120 options for E1; (3) select TX1 to be one of the claimed ergosterol biosynthesis inhibitors or quinone outside inhibitors from 250 group P components, “where such fungicides comprise a fraction (less than 20%) of the recited compounds;” and (4) select “a *mixed* combination from among 13 different permutations of a three-component ‘composition.’” *Id.* at 27–28 (citing Ex. 1006, 22:61–25:67, 28:6–57; Ex. 2020 ¶¶ 139–157).

Patent Owner argues that Petitioner has not shown that Tobler provides guidelines for selecting among the “vast number” of options in Tobler to arrive at the claimed fungicidal combinations. *Id.* at 22 (citing Ex. 2020 ¶¶ 135–138). Thus, Patent Owner concludes that an ordinarily skilled artisan would not have envisaged a claimed combination from the large genus that includes at least 3,250, and potentially as many as 390,000, permutations. *Id.* at 29–34.

Patent Owner also asserts that Petitioner has failed to show that Tobler teaches the “consisting of” limitation. PO Resp. 35–36. Patent Owner further contends that Tobler’s “composition” includes mixed and sequential applications, and thus, is distinct from the claimed “composition” and “combination.” *Id.* at 36–37.

b. Analysis

Tobler specifically discloses (1) the combination of mancozeb, benzovindiflupyr, and a group P compound, and (2) forty-seven of its group P compounds are fungicides recited in claim 1. Ex. 1006, 22:61–25:67, 28:6–11, 28:40; Pet. 30–32 (citing Ex. 1003 ¶¶ 138–144). Thus, although it is true that Tobler also discloses other embodiments in

several lists, Petitioner has met its burden in showing that an ordinarily skilled artisan would at once envisage the fungicidal combination of claim 1 from its disclosure. Accordingly, Tobler anticipates claim 1. We address Patent Owner's arguments below.

As an initial matter, we note Patent Owner's argument that "Tobler discloses no combinations of three fungicide classes, no combinations of three specific fungicides, and no properties of any three-component mixture." PO Resp. 26. To the extent Patent Owner implies that Tobler does not anticipate claim 1 because it does not reduce to practice a three-component mixture, we disagree.

"Anticipation does not require the actual creation or reduction to practice of the prior art subject matter; anticipation requires only an enabling disclosure." *Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1380 (Fed. Cir. 2003). Prior art patents are presumed enabled, and the patentee bears the burden to show nonenablement. *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1354–56 (Fed. Cir. 2003).

The standard for enablement of a prior art reference for purposes of anticipation under 35 U.S.C. § 102 differs from the enablement standard under § 112. *Novo Nordisk Pharms., Inc. v. Bio-Tech. Gen. Corp.*, 424 F.3d 1347, 1355 (Fed. Cir. 2005). To serve as an anticipating reference, a prior-art reference need only show it enables an ordinarily skilled artisan how to make, and not how to use, the claimed invention. *Rasmusson v. SmithKline Beecham Corp.*, 413 F.3d 1318, 1326 (Fed. Cir. 2005).

Patent Owner asserts in general that "[m]erely listing a vast genus of possible additional components, such a Tobler group P, would not have put a POSA in possession of or enabled every possible combination thereof." PO

Resp. 26 (citing Ex. 2020 ¶¶ 150–151, 153). This suggests that the enablement of claim 1 requires more than simply combining the recited fungicides—it does not. Claim 1 recites a fungicidal combination consisting of multiple known fungicides. It does not limit the combination in any way: not the efficacy, not the chemical and physical compatibility, and not the phytotoxicity of the combination. Thus, we find neither Patent Owner nor Dr. Jacobsen provides persuasive evidence or analysis to rebut the presumption that Tobler is enabled to make the combinations of fungicides it discloses, including a combination consisting of the fungicides recited in claim 1.

Patent Owner argues that Petitioner fails to address how Tobler would meet the “consisting of” limitation because Tobler is open to multiple group P compounds, including numerous ones not recited in claim 1. PO Resp. 35–36. We are not persuaded by this argument. Claim 1 includes combinations consisting of three fungicides. Tobler specifically discloses E1 embodiments with only three active ingredients. Ex. 1006, 28:6–8, 29:41–50. The fact that Tobler also discloses compositions with more than three fungicides does not undermine Petitioner’s reliance on the three-component compositions “Mancozeb+ benzovindiflupyr+ (group P component).” Pet. 30–31 (citing Ex. 1006, 28:6–8, 28:40). Thus, we find that each Tobler’s embodiment Petitioner relies on to challenge claim 1 satisfies the “consisting of” limitation.

Patent Owner contends that “Tobler does not disclose the recited limitations as arranged in the claims.” PO Resp. 25 (heading normalized). A reference, however, can anticipate a claim even if it does not expressly spell out all the limitations arranged or combined as in the claim, if a person

of skill in the art, reading the reference, would “at once envisage” the claimed arrangement or combination. *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1341 (Fed. Cir. 2016). Patent Owner argues that Tobler does not anticipate claim 1 because an ordinarily skilled artisan would not have envisaged from Tobler the mixed combinations or compositions of the challenged claims. We disagree.

Patent Owner appears to use the terms “genus” and “list” interchangeably. *See* PO Resp. 29 (“genus E1”), 30 (“Mancozeb+TX1 genus”), 34 (“multiple lists (E1, ‘Mancozeb+TX1,’ ‘group P’ . . .)”). “For the purposes of whether they are anticipatory,” however, “lists and genera are often treated differently.” *In re Gleave*, 560 F.3d at 1337. It is correct that a genus does not always anticipate a claim to a species within the genus; but when the species is clearly named, the species claim is generally anticipated no matter how many other species are additionally named. *Id.* at 1338. This is so even when the anticipated item appears in the list “without special emphasis.” *Id.* Here, Tobler presents its disclosure in the form of lists of fungicides that include those recited in the challenged claims, and not merely genera that fail to enumerate species consisting of the recited components. *See* Ex. 1006, 22:63–25:67 (listing group P compounds), 28:12–57 (listing E1 embodiments).

Patent Owner argues that anticipation precludes “picking and choosing.” PO Resp. 23 (citing *In re Arkley*, 455 F.2d 586, 587–88 (CCPA 1972)); *see also id.* at 24 (faulting Petitioner for relying on “multiple lists within Tobler”). Patent Owner further argues that Petitioner does not show Tobler provides specific guidance that would lead an ordinarily skilled artisan to an embodiment within claim 1. PO Resp. 28 (citing *Otonomy, Inc.*

v. Auris Med., AG, 743 F. App'x 430 (Fed. Cir. 2018)). This argument is also unavailing.

First, we find inapposite Patent Owner's argument that Tobler's "compositions," based on its "non-standard definition thereof, correspond[] to a genus of 13 different permutations of mixtures and sequential applications for three components." PO Resp. 23 (citing Ex. 2016; Ex. 2020 ¶¶ 148–150; Ex. 2021, 88:10–89:12). Tobler discloses:

Throughout this document the expression "composition" stands for the various mixtures or combinations of components (A) and (B), for example in a single "ready-mix" form, in a combined spray mixture composed from separate formulations of the single active ingredient components, such as a "tank-mix", and in a combined use of the single active ingredients when applied in a sequential manner, i.e. one after the other with a reasonably short period, such as a few hours or days. The order of applying the components (A) and (B) is not essential for working the present invention.

Ex. 1006, 27:55–64.

Although alleging this is a "non-standard definition," Patent Owner cites it elsewhere as showing "how a POSA would understand the terms [composition and combination] in the art, generally." *See* PO Resp. 5–6 (citing Ex. 1006, 27:55–64 as "defining composition"). Moreover, the language in Tobler is not appreciably different from the '727 patent's own description of its composition. Indeed, the '727 patent discloses that

[t]he combinations of the present invention may be sold as a pre-mix composition or a kit of parts such that individual actives may be mixed before spraying. Alternatively, the kit of parts may contain succinate dehydrogenase inhibitor fungicide and the dithiocarbamate fungicide pre-mixed and the third

active may be admixed with an adjuvant such that the two components may be tank mixed before spraying.

The composition of the present invention maybe [*sic*] applied simultaneously as a tank mix or a formulation or may be applied sequentially.

Ex. 1001, 19:54–63.

Because the compositions in both Tobler and the '727 patent encompass sequential applications (*see supra* Section III.C.1), we reject Patent Owner's argument that, an ordinarily skilled artisan would have to "[s]elect a *mixed* combination from among 13 different permutations of a three-component 'composition'" in Tobler. PO Resp. 28. For the same reason, contrary to Patent Owner's assertion, Petitioner's Tobler-based challenges do not fall merely because Tobler's compositions include sequential applications.¹⁹ *See id.* at 37.

Second, selecting specifically identified components from more than one list, on its own, is not fatal to Petitioner's anticipation challenge. For example, in *Kennametal*, the claims-at-issue involved a metal with a coating. 780 F.3d at 1379. The prior-art reference did not explicitly disclose the specific metal and coating combination; instead, it disclosed different classes of metals with multiple options for coating. *Id.* at 1379–80. Nonetheless, the Federal Circuit agreed with the Board that the reference anticipated each of the numerous possibilities that resulted from the permutations of the options disclosed in the reference. *Id.* at 1382–83.

¹⁹ Tobler discloses fungicides "in a combined spray mixture composed from separate formulations of the single active ingredient components, such as a 'tank mix.'" Ex. 1006, 27:55–64. Therefore, our anticipation finding for this ground would be the same even under Patent Owner's construction of "combination" or "composition."

Instead of the blanket statement that “picking and choosing . . . has no place in § 102,” as Patent Owner argues (PO Resp. 23 (quotation marks omitted)), the court cautioned against “picking, choosing, and combining various disclosures *not directly related to each other by the teachings of the cited reference.*” *Arkley*, 455 F.2d at 587 (emphasis added). Thus, a patent challenger fails to show anticipation if it only “points to multiple, distinct teachings” in the prior art, but “does not identify guidance in the disclosure to link them together.” *Otonomy*, 743 F. App’x at 439. On the other hand, even when a reference does not explicitly disclose the claimed combination, it still may anticipate if it “teaches that the disclosed components or functionalities may be combined and one of skill in the art would be able to implement the combination.” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1343–44 (Fed. Cir. 2016) (citing *Kennametal*, 780 F.3d at 1383).

Here, Petitioner’s alleged “picking, choosing, and combining” are of disclosures not separate and distinct, but directly related to each other. Tobler spells out the composition “mancozeb+TX1” as an E1 embodiment, and defines TX1 to mean “the compound A 1.1 [benzovindiflupyr]+a compound selected from the group P.” Ex. 1006, 28:10–11, 28:40. In other words, Tobler expressly links the E1 and group P lists. As such, Tobler specifically discloses a composition with “three active ingredients:” benzovindiflupyr, mancozeb, and a group P compound.

For group P compounds, Tobler lists 250 fungicides. Ex. 1006, 22:61–25:67. Petitioner argues, and Patent Owner does not dispute, that forty-seven of the group P compounds are among the fifty-five other fungicides recited in claim 1. Pet. 31. Patent Owner, however, emphasizes

that “such fungicides comprise a fraction (less than 20%) of the recited [group P] compounds.” PO Resp. 27. This fact alone, however, does not doom Petitioner’s anticipation challenge.

“The anticipation analysis asks solely whether the prior art reference discloses and enables the claimed invention, and not how the prior art characterizes that disclosure or whether alternatives are also disclosed.” *Hewlett–Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1324 n.6 (Fed. Cir. 2003); *see also Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, 683 F.3d 1356, 1362 n.4 (Fed. Cir. 2012) (“The fact that one of ordinary skill in the art might also have included other flavorings would not remove the resulting composition from the broad reach of [the challenged claim].”).

Indeed, the Federal Circuit has explained that a reference that “teaches a total of fourteen skin benefit ingredients” anticipates a claim that recites one of them, even though “it appears without special emphasis in a longer list.” *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1376 (Fed. Cir. 2005). Needless to say, forty-seven out of 250 (i.e., ~ 19%) in this case is a larger “fraction” than one out of fourteen (i.e., ~ 7%) in *Perricone*.

Patent Owner contends that this case is distinguishable from *Perricone* because the list there included only fourteen ingredients. PO Resp. 33. We are not persuaded by this argument. Although Tobler’s list of group P compounds includes 250 members, an even higher fraction of those, i.e., nearly three out of every fourteen as compared to one out of fourteen in *Perricone*, are recited in challenged claim 1. Moreover, it is not the mere number of the items in the list, but rather, the total circumstances involved, that is significant in an anticipation analysis. *In re Petering*, 301 F.2d 676, 681 (CCPA 1962). For example, a reference listing more than

1,400 “every possible” “fifteen-base sense oligodeoxynucleotide in a known nucleic acid sequence anticipates or renders obvious claims to specific antisense sequences.” *Gleave*, 560 F.3d at 1333, 1334, 1338.

Third, we find both knowledge in the art and Tobler provide further guidance that would lead an ordinarily skilled artisan to numerous embodiments within claim 1.²⁰ For example, Petitioner argues that “as early as 2010, mancozeb was the ‘go-to’ fungicide to add to a mixture to improve disease control or efficacy.” Pet. 69 (heading normalized).

Citing Gullino,²¹ a 2010 review article, Petitioner asserts that mancozeb “plays a significant role in the world fungicide market.” *Id.* (citing Ex. 1010). Petitioner highlights “a number of key attributes” of mancozeb discussed in Gullino. *Id.* at 69–70 (citing Ex. 1010, 1078–80; Ex. 1003 ¶ 85). According to Gullino, as of 2010, “the agrochemical industry has yet to develop another product with the combination of properties (i.e., efficacy, broad-spectrum, crop safety, low resistance risk, and low cost) that make mancozeb so successful.” Ex. 1010, 1083.

According to Gullino, “[f]ungicide resistance is a serious and intensively studied issue in the management of many key fungal diseases of most crops,” including soybeans. *Id.* at 1081. Petitioner argues that there was a “clear trend towards decreasing efficacy in controlling soybean rust severity or increasing yield” between seasons. Pet. 70 (citing Ex. 1021 ¶¶ 12–20). According to Petitioner, evidence shows there was a need for

²⁰ Although this further supports Petitioner’s position, it is not necessary to our patentability determination. The findings above are themselves sufficient to demonstrate that claim 1 is anticipated by Tobler.

²¹ Gullino et al., *Mancozeb Past, Present, and Future*, 94(9) Plant Disease 1076–87 (2010) (Ex. 1010, “Gullino”).

“resistance management of fungicidal combinations.” *Id.* (citing Ex. 1021 ¶¶ 12–20).

Petitioner notes Gullino’s discussion of using mancozeb “as a key tool in resistance management.” Pet. 70 (citing Ex. 1010, 1081). According to Dr. Brannen,

Gullino discloses that “mixtures of fungicides that combine a high resistance risk with a low risk multi-site compound or another single site fungicide that is not cross-resistant to its mixing partner are a common response to [the management of fungus resistance]”. Gullino (Ex. 1010) at 1081, left col., second paragraph. A POSA would understand that Gullino was explaining common ways to reduce resistance of fungi to particular fungicides, which included: (1) mixing fungicides that have a high resistance risk with a low risk multisite compound, such as mancozeb, or (2) mixing fungicides that do not have cross-resistance, e. g., mixing fungicides with different modes of action. Gullino (Ex. 1010) at p. 1081; see also 1077 (left col.). Gullino then explained “mancozeb’s role as a key tool within resistance management strategies is firmly grounded on the intrinsically low resistance risk of the molecule itself.” *Id.* Gullino further reported the improved resistance performance of mancozeb when combined with QoI fungicides, for example. Gullino (Ex. 1010) at p. 1081 (right col.).

Ex. 1003 ¶ 86.

On this record, Petitioner has presented sufficient evidence to show that “it was well known in the art and expected that the combination of mancozeb (a multisite, contact fungicide) with other fungicides would result in improved disease control, reduce resistance, and in certain instances synergistic interactions.” Ex. 1003 ¶ 87; *see also* Pet. 69 (citing Ex. 1003 ¶ 87; Exs. 1005, 1010). Thus, we find that knowledge in the art would guide an ordinarily skilled artisan to the E1 embodiment “mancozeb+TX1.”

We also find that Tobler’s teachings would guide an ordinarily skilled artisan to certain specific group P compounds. As Petitioner points out, Tobler discloses benzovindiflupyr as an “especially preferred” compound for component (A). Pet. 28 (citing Ex. 1006, 1:40–64, 13:50–14:6). In fact, Tobler also discloses more than that; it states “[f]urther especially preferred compositions according to the invention comprise as component (A) the compound . . . (compound A-1.1) [benzovindiflupyr] and as component (B) a compound selected from *azoxystrobin*, *picoxystrobin*, bixafen, fludioxonil, fenpropidin, *difenoconazole*, cyprodinil, mandipropamid, chlorothalonil, *propiconazole*, *cyproconazole* and *epoxiconazole*.” Ex. 1006, 13:50–14:6 (emphases added). We find these specifically identified component (B) compounds in the “[f]urther especially preferred compositions” provide guidance to the selection of group P compounds, which are also component (B) compounds.

Patent Owner asserts that “a POSA would understand that not all group P components used in the ‘mancozeb+TX1’ genus are suitable for use in mixed combinations or compositions.” PO Resp. 37 (citing Ex. 2020 ¶¶ 157–168); *see also id.* at 25–26 (“[A] POSA would not arbitrarily mix from a laundry list of chemically active fungicides at least because of unknown effects on (i) efficacy, (ii) chemical and physical compatibility, and (iii) phytotoxicity.”) (citing Ex. 2020 ¶¶ 4, 177, 132; Ex. 2021, 33:8–34:5, 35:15–38:11).

We are not persuaded by this argument for two reasons. First, none of the challenged claims recites efficacy, compatibility, or phytotoxicity. Second, under our claim construction, the challenged claims encompass sequential application as disclosed in Tobler, which would seem to avoid the

chemical and physical compatibility concerns Patent Owner identifies. Thus, we agree with Petitioner that Patent Owner's argument on this issue is irrelevant to our anticipation analysis. *See* Reply 9.

To support its arguments, Patent Owner also cites *Mylan Pharms. Inc. v. Merck Sharp & Dohme Corp.*, 50 F.4th 147 (Fed. Cir. 2022). *See* PO Resp. 30. In *Mylan*, the claim-at-issue recited a sitagliptin dihydrogenphosphate ("DHP") salt with a 1:1 stoichiometry. 50 F.4th at 150. The prior art did not expressly disclose the specific 1:1 DHP salt of sitagliptin. *Id.* at 151. Instead, it disclosed a genus of dipeptidyl peptidase-IV inhibitors and 33 species, one of which was sitagliptin. *Id.* at 150. It also disclosed that pharmaceutically acceptable salts can be formed using one of eight acids, one of which is phosphoric acid. *Id.* The prior art, however, did not address the 1:1 stoichiometry, and the Board found on the record in that case that the patent challenger "could not fill in the gaps by arguing that a skilled artisan would 'at once envisage' what is missing." *Id.* at 151.

On appeal, the Federal Circuit affirmed. *Id.* at 151. The court acknowledged that a prior art reference "may be deemed to disclose each member of a genus when, reading the reference, a person of ordinary skill can 'at once envisage each member of this limited class.'" *Id.* at 152 (quoting *Petering*, 301 F.2d at 681). Although emphasizing the "key term here is 'limited,'" the court declined to provide a specific number defining a "limited class." *Id.* at 153–54. Instead, the court explained that what counts as "limited" "depends on the 'class.'" *Id.* at 154. The Federal Circuit held that the Board did not err in finding that a class of 957 predicted salts that may result from the 33 disclosed compounds, eight preferred acids, and various stoichiometric possibilities, "some of which may not even form

under experimental conditions.” *Id.* In other words, the class in *Mylan* is uncertain, and thus, not “limited.”

The facts of *Mylan* are distinguishable from those here. First, the claim in *Mylan* recited additional limitations, e.g., a 1:1 stoichiometry, that were not disclosed in the prior art at issue. *See* 50 F.4th at 151 (noting the Board’s finding “that evidence, both experimental and from the technical literature, undeniably showed that 1:1 sitagliptin DHP does not form every time sitagliptin and DHP were reacted”). Here, however, claim 1 does not recite any limitation that Tobler fails to address. Second, having weighed the evidence of record here, we find that Tobler discloses a sufficiently limited class of compositions such that a skilled artisan could at once envisage the claimed combination. As explained above, Tobler specifically discloses the combination of benzovindiflupyr, mancozeb, and one other active ingredient, i.e., a group P compound. Given there are 250 members in group P, there are 250 “mancozeb + benzovindiflupyr + group P compound” combinations and a significant fraction of those (i.e., approximately one in five) reads on claim 1. These facts further distinguish this case from *Mylan*.

Finally, we are not persuaded by Patent Owner’s reliance on other case law. For example, Patent Owner represents that in *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, the Federal Circuit “revers[ed the] Board’s anticipation finding where ground reference disclosed five binding agents (one claimed) and three coating techniques (one claimed) and taught that any of the five binding agents could be used together.” PO Resp. 30–31 (citing 851 F.3d 1270, 1274–75 (Fed. Cir. 2017)).

The patent-at-issue in *Nidec*, however, related to a system for controlling the torque of an electromagnetic motor; it did not discuss binding

agents and coating techniques. 851 F.3d at 1271. The fact pattern Patent Owner describes appears to be from *Kennametal*, and not *Nidec*. *Id.* at 1274. More importantly, contrary to Patent Owner’s assertion, under the fact pattern in *Kennametal*, the court did not reverse the Board’s anticipation finding; instead, it “held that substantial evidence supported the Board’s finding that the reference effectively taught fifteen combinations, one of which anticipated the challenged claim.” *Id.* (citing *Kennametal*, 780 F.3d at 1382–83).

In *Nidec*, the Federal Circuit reversed the Board’s finding of anticipation, not because the Board engaged in “picking and choosing,” but because “*Kennametal* does not permit the Board to fill in missing limitations simply because a skilled artisan would immediately envision them.” *Id.* at 1274–75. That is not the case here. It is undisputed that Tobler discloses all three fungicides recited in claim 1.

As another example, in its attempt to distinguish *Perricone*, Patent Owner allegedly quotes from “*Wm. Wrigley Jr. Co. v. Cadbury Adams USA LLC*, [683] F.3d 1356, 1371–72 (Fed. Cir. 2012) (Newman, P, concurring).” The quoted language, however, is from a dissenting opinion, and does not bind us. Instead, the majority in *Wm. Wrigley Jr.* confirmed that *Perricone* “distinguish[es] cases in which a prior art reference discloses a genus from those in which it discloses a number of species as part of a list.” 683 F.3d at 1361.

In *Wm. Wrigley Jr.*, the patentee presented an argument similar to one advanced by Patent Owner in this case, that is, that the prior-art reference did not anticipate because although it “discloses all the claim limitations found in [the claim-at-issue], it did not disclose them in the combination

recited in that claim.” *Id.* at 1360. Finding it “[wa]s not a case in which the prior art reference merely discloses a genus and the claim at issue recites a species of that genus,” the majority rejected the appellant’s argument and affirmed the anticipation finding. *Id.* at 1361. Here, Tobler also does not merely disclose a genus, it specifically discloses the fungicides recited in claim 1 as well as a three-fungicide combination of such, as explained above. Thus, we follow the reasoning of the majority opinion in *Wm. Wrigley Jr.* and reject Patent Owner’s similar argument.

In sum, based on this record, we find Petitioner has shown, by a preponderance of the evidence, that Tobler anticipates claim 1.

3. Claims 3 and 4

Each of claims 3 and 4 depends from claim 1. Specifically, claim 3 further recites that the “at least another fungicide is cyproconazole, difenoconazole, epoxiconazole, hexaconazole, hexaconazole, tebuconazole, tetraconazole, prothioconazole, azoxystrobin, picoxystrobin, pyraclostrobin, kresoxim-methyl, trifloxystrobin, or a combination thereof;” and claim 4 further recites that the “at least another fungicide is prothioconazole and/or azoxystrobin.”

Petitioner argues that each of the twelve fungicides recited in claim 3 and the two recited in claim 4 are listed in Group P of Tobler. Pet. 36 (citing Ex. 1006, 22:61–25:67). According to Petitioner, the “substantial overlap” between the claims and Tobler’s disclosure shows that Tobler anticipates claims 3 and 4. *Id.* Patent Owner counters that Petitioner’s “overlap” theory is flawed for the same reasons discussed in claim 1. PO Resp. 39. According to Patent Owner, Petitioner’s theory is further flawed due to the “smaller overlap of these narrower dependent claims.” *Id.* We are not persuaded by

Patent Owner’s arguments for the same reasons as explained above in addressing claim 1. *See supra* Section III.E.2.b.

Tobler specifically discloses the combination of mancozeb + benzovindiflupyr + (group P component). Ex. 1006, 28:6–8, 28:10–11, 28:40. Its list of 250 group P components includes the twelve and two fungicides recited in claims 3 and 4, respectively. *Id.* at 22:61–25:67; *see also id.* at 13:50–14:6 (disclosing that “[f]urther especially preferred compositions according to the invention” comprise benzovindiflupyr and “a compound selected from *azoxystrobin*, *picoxystrobin*, bixafen, fludioxonil, fenpropidin, *difenoconazole*, cyprodinil, mandipropamid, chlorothalonil, propiconazole, *cyproconazole* and *epoxiconazole*” (emphases added to show the fungicides recited in claims 3 and 4). As such, the fact that claims 3 and 4 are somewhat narrower than claim 1 does not materially affect the outcome of our anticipation analysis.

In sum, we find Tobler anticipates claims 3 and 4 because Tobler specifically lists the fungicides recited in those claims in combination with the other recited fungicides.

4. Claims 5 and 6

Claim 5 recites a composition consisting of “at least one agrochemically acceptable excipient,” and a fungicidal combination of claim 1. Referring to Tobler’s disclosure of “mixing the active ingredients with at least one appropriate inert formulation adjuvant,” Petitioner argues that “Tobler illustrates the addition of ‘at least one agrochemically acceptable excipient’ is ‘conventional.’” Pet. 37 (citing Ex. 1006, 36:23–28; Ex. 1003 ¶¶ 168–169).

Claim 6 depends from claim 5 and further recites numerous formulations of the composition. Referring to Tobler’s disclosure of dozens

of formulations, Petitioner contends that Tobler’s formulations “significantly overlap” with those claimed. *Id.* at 38 (citing Ex. 1006, 36:4–22), 45–47 (citing Ex. 1006, 36:4–39).

Patent Owner faults Petitioner for arguing that a “POSA would have been *motivated to formulate* the fungicidal combinations disclosed and suggested by Tobler.” PO Resp. 39 (citing Pet. 38; Ex. 2020 ¶¶ 195–201) (emphasis added by Patent Owner). According to Patent Owner, “[a]n alleged ‘*motivation to formulate*’ does not, however, even purport to argue anticipation.” *Id.* Patent Owner’s argument is unavailing.

As explained above, Tobler discloses the fungicidal combinations of claim 1. *See supra* Section III.E.2.b. Patent Owner does not dispute that Tobler discloses “at least one agrochemically acceptable excipient,” as recited in claim 5, and nearly all the formulations from the list of formulations recited in claim 6. In other words, Tobler anticipates claims 5 and 6 because it discloses each limitation thereof. No more is needed.²²

5. Claims 7 and 8

Claim 7 depends from claim 1 and further recites that “benzovindiflupyr and mancozeb are admixed in ratio of 1:80 to 80:1.” Petitioner argues that Tobler anticipates claim 7 because “Tobler discloses preferable ranges which encompass 1:80 to 80:1 ratio—100:1 to 1:100—and

²² Petitioner groups anticipation and obviousness challenges together. *See* Pet. 29–34, 36–42 (arguing that each of claims 1 and 3–10 “is anticipated or obvious over Tobler—optionally in view of Godoy”) (headings normalized). We do not advise such practice. Nonetheless, substance beats form. Petitioner clearly points to Tobler’s disclosure of each limitation, and thus, shows by a preponderance of the evidence that Tobler anticipates these claims.

more preferable ranges which are within 1:80 to 80:1—20:1 to 1:50.” Pet. 39 (citing Ex. 1006, 34:26–32).

Claim 8 depends from claim 5 and further recites that the total amount of benzovindiflupyr, mancozeb, ergostrol biosynthesis inhibitor, and quinone outside inhibitor in the composition is each in the range of 0.1 to 99% by weight. Tobler discloses its “formulations include from 0.01 to 90% by weight of active agent,” and “[c]oncentrated forms of compositions generally contain in between about 2 and 80%, preferably between about 5 and 70% by weight of active agent.” Ex. 1006, 36:52–65. Relying on these disclosures, Petitioner argues that Tobler anticipates claim 8 because the ranges recited in claim 8 overlap with those in Tobler. Pet. 40–41.

Patent Owner counters that Petitioner’s arguments that Tobler’s ranges “encompass,” “overlap,” or “embrace” those of claims 7–8 are not proper bases for anticipation. PO Resp. 39 (citing Pet. 39–41). We are not persuaded by this argument.

“A prior art reference that discloses an overlapping but different range than the claimed range can be anticipatory, even where the prior art range only partially or slightly overlaps with the claimed range.” *Genentech, Inc. v. Hospira, Inc.*, 946 F.3d 1333, 1338 (Fed. Cir. 2020). Petitioner argues, and Patent Owner does not dispute, that the range of 0.1 to 99% recited in claim 8 overlaps with Tobler’s range of “from 0.01 to 90%.” Pet. 40. Because Petitioner “has established, through overlapping ranges, its prima facie case of anticipation,” we must evaluate whether Patent Owner “has established that the claimed range is critical to the operability of the claimed invention.” *Genentech*, 946 F.3d at 1338. We find Patent Owner not done so.

Moreover, for claim 7, Petitioner argues that Tobler's more preferable range of 20:1 to 1:50 is "within" the claimed 1:80 to 80:1 range. Pet. 39. Similarly, for claim 8, Petitioner points to Tobler's range of between "about 2 and 80%," which is within the claimed range of 0.1 to 99%. *Id.* at 40–41. Thus, Petitioner has shown by a preponderance of the evidence that Tobler anticipates claims 7 and 8.

6. Claims 9 and 10

Claim 9 is directed to "[a] method of foliar application, consisting of applying the combination of claim 1 to the foliage of a plant." Claim 10 is directed to "[a] method of controlling fungal diseases in plants consisting of, applying to the locus of the plant" the combination of claim 1. Relying on Tobler's disclosure that "[s]ome compositions according to the invention have a systemic action and can be used as foliar, soil and seed treatment fungicides," Petitioner contends that "Tobler discloses the fungicidal compositions can be used as a foliar application (claim 9) and locus application (claim 10)." Pet. 41–42 (citing Ex. 1006, 35:29–31), 49 (citing Ex. 1006, 12:26–29). Thus, Petitioner concludes that Tobler anticipates claims 9 and 10. *Id.*

Patent Owner acknowledges that Tobler discloses "'some compositions' can be applied to certain locations," but argues that such disclosure "does not support anticipation of the specifically claimed combinations and compositions being so applied." PO Resp. 40. We are not persuaded by this argument either.

In evaluating anticipation, it is permissible to take into account not only the express teachings of the prior art reference, but also the inferences an ordinarily skilled artisan would draw from it. *Eli Lilly and Co. v. Los*

Angeles Biomedical Res. Inst. at Harbor-UCLA Med. Ctr., 849 F.3d 1073, 1074–75 (Fed. Cir. 2017) (“[T]he dispositive question regarding anticipation is whether one skilled in the art would reasonably understand or infer from a prior art reference that every claim element is disclosed in that reference.”); *In re Graves*, 69 F.3d 1147, 1152 (Fed. Cir. 1995) (“A reference anticipates a claim if it discloses the claimed invention such that a skilled artisan could take its teachings in combination with his own knowledge of the particular art and be in possession of the invention.”) (quotation marks omitted).

Tobler discloses that at least some of its compositions can be applied to the foliage. Ex. 1006, 35:29–31. Dr. Brannen testifies that dithiocarbamate fungicides, such as mancozeb, are known as contact fungicides that act on plants. Ex. 1003 ¶¶ 44, 45. He also testifies that “it was well known to POSAs that mancozeb is commonly applied to the leaves of plants.” *Id.* ¶ 128 (citing Ex. 1010, 1078–79). Patent Owner does not dispute these statements.

Other evidence supports Dr. Brannen’s testimony. *See, e.g.*, Ex. 1007, 7 (explaining that the contact protective dithiocarbamate fungicide “effectively penetrates the dense plant foliage”), 12 (stating mancozeb is a preferred dithiocarbamate). Thus, an ordinarily skilled artisan would have understood that Tobler’s anticipatory combination mancozeb + benzovindiflupyr + (group P component) can be applied to the foliage, as recited in claim 9.

The ’727 patent explains that the “locus” of a plant refers to “the place on which the plants are growing.” Ex. 1001, 2:55–56. Tobler discloses that some compositions “have a systemic action” and can be applied to the soil, i.e., the locus of the plant. Ex. 1006, 35:29–31. Dr. Brannen testifies that

SDHI fungicides, such as benzovindiflupyr, as well as quinone outside inhibitors and demethylation inhibitors, are considered systemic fungicides that act within plants. Ex. 1003 ¶¶ 44, 45, 104. Patent Owner does not dispute these statements.

Other evidence also supports Dr. Brannen’s testimony. *See, e.g.*, Ex. 1007, 10 (explaining that a systemic fungicide “is absorbed into the plant tissue and possesses at least some amount of an after-infection activity,” stating quinone outside inhibitors are systemic fungicides), 11 (stating demethylation inhibitors are systemic fungicides), 15 (stating SDHIs are systemic fungicides); Ex. 1009, 8 (teaching that benzovindiflupyr is an SDHI). Thus, an ordinarily skilled artisan would have understood that Tobler’s anticipatory combination mancozeb + benzovindiflupyr + (group P component) can be applied to the soil, i.e., the locus of the plant, as required in claim 10.

In sum, Petitioner has shown by a preponderance of the evidence that Tobler anticipates claims 9 and 10.

F. Alleged Obviousness over De Oliveira and Other Prior Art

Petitioner further argues that claims 1–10 would have been obvious over De Oliveira, either alone or in combination with Wiglesworth, Tobler, and Godoy. Pet. 50–67. Having determined that Petitioner has shown that claims 1 and 3–10 are anticipated by prior art (*see supra* Sections III.D, III.E), we need not further address the patentability of those claims under this ground. This leaves claim 2, which we discuss below.

1. De Oliveira

De Oliveira teaches a fungicidal combination for treating soybean rust infection, “wherein the combination comprises a first dithiocarbamate fungicide, and at least [a] second fungicide selected from a demethylation

inhibitor, quinone outside inhibitor, succinate dehydrogenase inhibitor, quinone inside inhibitor or combinations thereof.” Ex. 1007, 7.

According to De Oliveira, the combination of “a contact protective dithiocarbamate fungicide” and at least one such second fungicide, which De Olivera describes as a “systemic fungicide,” “effectively penetrates the dense canopy barrier of the infected leguminous plant while simultaneously not allowing the rust pathogen to move up the plant foliage.” *Id.*

De Oliveira teaches mancozeb as a dithiocarbamate and specifically states that “[t]he addition of mancozeb to existing combination products greatly increased the efficacy of the known combinations, thereby acting as a synergist, improving the rate of disease control and improving the overall health of the plant.” *Id.* at 22; *see also id.* at 25 (the same).

De Oliveira teaches that the systemic fungicide can be a combination of at least one quinone outside inhibitor and at least one demethylation inhibitor. *Id.* at 11. Specifically, De Oliveira teaches an embodiment, wherein the preferred dithiocarbamate is mancozeb, the preferred quinone outside inhibitor is a strobilurin fungicide selected from trifloxystrobin, picoxystrobin, azoxystrobin or pyraclostrobin, and the preferred demethylation inhibitor is a conazole fungicide selected from prothioconazole, tebuconazole, cyproconazole, epoxiconazole, metconazole and tebuconazole. *Id.* at 12, 20; *see also id.* at 13–14 (describing embodiments wherein “the preferred strobilurin is picoxystrobin and the preferred conazole is tebuconazole,” “the preferred strobilurin is picoxystrobin and the preferred conazole is cyproconazole,” “the preferred strobilurin is azoxystrobin and the preferred conazole is cyproconazole,” and

“the preferred strobilurin is trifloxystrobin and the preferred conazole is selected from cyproconazole, propiconazole or tebuconazole”).

De Oliveira further teaches a method for treating soybean rust, comprising “treating the plant at the locus of the infection with mancozeb or combinations thereof with chlorothalonil; and concurrently, prior or subsequently to mancozeb, with at least one strobilurin fungicide selected from trifloxystrobin, picoxystrobin, azoxystrobin or pyraclostrobin, and at least one conazole fungicide selected from prothioconazole, tebuconazole, cyproconazole, epoxiconazole, metconazole and tebuconazole.” *Id.* at 12–13.

2. Summary of the Parties’ Arguments

Petitioner contends that De Oliveira teaches “treating the plant at the locus of the infection with a **dithiocarbamate fungicide**, and concurrently, prior or subsequently to the dithiocarbamate fungicide, with at least another fungicide selected from **a demethylation inhibitor, quinone outside inhibitor, succinate dehydrogenase inhibitor, quinone inside inhibitor or combinations thereof.**” Pet. 51 (citing Ex. 1007, 7). Petitioner points to De Oliveira for teaching mancozeb as a dithiocarbamate fungicide. *Id.* (citing Ex. 1007, 9). In addition, according to Petitioner, (1) there is a “significant overlap” between the quinone outside inhibitors (commonly known as strobilurins) disclosed in De Oliveira and those claimed in the ’727 patent, and (2) there is a “significant overlap” between the conazoles (the preferred demethylation inhibitors) disclosed in De Oliveira and the ergosterol biosynthesis inhibitors claimed in the ’727 patent. *Id.* (citing Ex. 1003 ¶¶ 159, 195, 196; Ex. 1007, 11).

Petitioner relies on the combination mixtures A(2), B(2), C(2), and D(2), each of which includes mancozeb, a strobilurin, and a conazole. *Id.*

at 52 (citing Ex. 1007, 25). Petitioner emphasizes that, in De Oliveira, the incorporation of mancozeb acted as a synergist and increased the rust control of the conventional strobilurin + conazole fungicide treatment standard. *Id.* (citing Ex. 1003 ¶¶ 196, 197; Ex. 1007, 25).

Petitioner argues that “De Oliveira explicitly states that the combination can further include a succinate dehydrogenase inhibitor, (SDHI).” *Id.* Acknowledging that De Oliveira does not disclose benzovindiflupyr as an SDHI, Petitioner contends that “it would have been obvious to include benzovindiflupyr in any one of combinations A(2), B(2), C(2), and D(2) of De Oliveira because De Oliveira states the combinations can further include an SDHI, and Wiglesworth, Tobler and Godoy provide additional motivation for selection and a reasonable expectation of success.” *Id.* at 54. Petitioner asserts that the combination of benzovindiflupyr with any one of combinations A(2), B(2), C(2), and D(2) falls within the scope of claim 2. *Id.* at 55.

Patent Owner emphasizes that De Oliveira discloses sixteen preferred SDHIs, and benzovindiflupyr is not one of them. PO Resp. 57 (citing Ex. 1007, 16). Patent Owner argues that Petitioner fails to explain “*why* a POSA would have selected an undisclosed SDHI (benzovindiflupyr) over other SDHIs disclosed in—and preferred by—De Oliveira.” *Id.* at 52, 57–58. Patent Owner further asserts that Wiglesworth, Tobler, and Godoy do not cure the deficiencies in De Oliveira, and that Petitioner fails to address the motivation to combine any secondary reference with De Oliveira. *Id.* at 61–68.

3. Analysis

Claim 2 is directed to a fungicidal combination consisting of four fungicides: benzovindiflupyr, mancozeb, an ergosterol biosynthesis inhibitor

fungicide selected from a Markush group, and a quinone outside inhibitor fungicide selected from a Markush group.

As a preliminary matter, we reject Patent Owner's argument that "Petitioner provides no reason for why a POSA would omit each of" the numerous copper fungicides, sulfur fungicides, phthalimide fungicides, chloronitrile fungicides, sulfamide fungicides, guanidine fungicides, all of which are excluded from the challenged claims. PO Resp. 59–60 (citing Ex. 1007, 8–9). These fungicides, like dithiocarbamates, are described as multi-site contact fungicides as opposed to systemic fungicides. Ex. 1007, 8. Thus, an ordinarily skilled artisan would not have considered them in De Oliveira's combination of dithiocarbamates and at least one systemic fungicide "selected from a demethylation inhibitor, quinone outside inhibitor, succinate dehydrogenase inhibitor, quinone inside inhibitor or combinations thereof." *Id.* at 7.

We also reject Patent Owner's argument that "Petitioner has not established motivation for multiple component selections." PO Resp. 58 (heading normalized). For example, Patent Owner asserts that "Petitioner provides no reason why a POSA would select mancozeb over the 24 alternative dithiocarbamates." *Id.*; *see also id.* & n.20 (arguing Petitioner makes "multiple unsupported selections" from De Oliveira's dithiocarbamates, demethylation inhibitors, quinone outside inhibitors, and quinone inside inhibitors, the last category of which "are exclude from the challenged claim"), *id.* at 54 (arguments 1, 2, and 5).

De Oliveira, however, specifically teaches a fungicide combination, wherein the preferred dithiocarbamate is mancozeb, the preferred quinone outside inhibitor is a strobilurin fungicide selected from trifloxystrobin,

picoxystrobin, azoxystrobin or pyraclostrobin, and the preferred demethylation inhibitor is a conazole fungicide selected from prothioconazole, tebuconazole, cyproconazole, epoxiconazole, metconazole and tebuconazole. *Id.* at 12, 20. Indeed, Petitioner relies on the following specific combinations:

A(2): mancozeb + azoxystrobin + cyproconazole;

B(2): mancozeb + pyraclostrobin + epoxiconazole;

C(2): mancozeb + cyproconazole + picoxystrobin; and

D(2): mancozeb + picoxystrobin + tebuconazole.

Pet. 52 (citing Ex. 1007, 25). Each of these combinations includes mancozeb, a quinone outside inhibitor recited in claim 2, and an ergosterol biosynthesis inhibitor recited in claim 2.²³ Because De Oliveira specifically discloses these combinations, a POSA would not have needed to make selections from the broader categories of fungicides to arrive at them.

We, thus, are left with the question whether Petitioner has demonstrated, by a preponderance of the evidence, that an ordinarily skilled artisan would have had a reason to add benzovindiflupyr to each of the combinations A(2), B(2), C(2), and D(2). We find Petitioner has done so.

As Petitioner points out, De Oliveira teaches a fungicidal combination comprising dithiocarbamate and at least one systemic fungicide “selected from a demethylation inhibitor, quinone outside inhibitor, succinate dehydrogenase inhibitor, quinone inside inhibitor or combinations thereof.” Pet. 51 (citing Ex. 1007, 7). De Oliveira also teaches that when multiple

²³ Petitioner asserts, and Patent Owner does not dispute, that “the ’727 patent essentially recasts the [demethylation inhibitors] conazoles of De Oliveira as ergosterol biosynthesis inhibitors in the ’727 patent.” Pet. 51 (citing Ex. 1001, 6:23–34; Ex. 1007, 11).

systemic fungicides are included in a combination, they preferably are selected from different classes of systemic fungicides. Ex. 1007, 18. Given that each of A(2), B(2), C(2), and D(2) includes a demethylation inhibitor and a quinone outside inhibitor, an ordinarily skilled artisan would have been motivated to add to those combinations a fungicide from one or both of the other two classes of systemic fungicides taught in De Oliveira, i.e., SDHIs and quinone inside inhibitors. *See id.* at 7.

Patent Owner emphasizes that the two quinone inside inhibitors²⁴ disclosed in De Oliveira are “categorically outside the scope of the challenged claims.” *Id.* at 59 n.23, 60. According to Patent Owner, Petitioner fails to address the exclusion of the unclaimed quinone inside inhibitors, and thus, fails to address the “consisting of” limitation. *Id.* at 59–60. But just because De Oliveira teaches the combination of a quinone inside inhibitor with, for example, A(2), or the combination of a quinone inside inhibitor and an SDHI with A(2), does not render the combination of an SDHI with A(2) less obvious. *See Merck & Co., Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (“Disclos[ing] a multitude of effective combinations does not render any particular formulation less obvious.”). “This is especially true” here, “because the claimed composition is used for the identical purpose taught by the prior art.” *Id.*

Patent Owner is correct that De Oliveira teaches sixteen preferred SDHIs and benzovindiflupyr is not one of them. PO Resp. 57 (citing Ex. 1007, 16). Petitioner, however, contends that benzovindiflupyr was

²⁴ Patent Owner states that cyazofamid and amisulbrom are “quinone outside inhibitors.” PO Resp. 60. De Oliveira, in fact, teaches they are quinone inside inhibitors. Ex. 1007, 14.

a known SDHI. Pet. 53 (citing Ex. 1003 ¶ 198). Petitioner also points to Wiglesworth for teaching benzovindiflupyr as “extremely efficacious on soybean rust.” *Id.* (citing Ex. 1008, S2.11).

Patent Owner counters that Wiglesworth only promotes benzovindiflupyr alone for soybean rust, and “provides no teaching, suggestion, or motivation to use benzovindiflupyr in combination with any other component for this application.” PO Resp. 63 (citing Ex. 2020 ¶¶ 225–228). Petitioner, however, relies on De Oliveira, and not Wiglesworth, at least not Wiglesworth alone, as teaching the claimed combination. *See In re Keller*, 642 F.2d 413, 426 (C.C.P.A. 1981) (stating where, as here, the obviousness challenges are based on combinations of references, “one cannot show non-obviousness by attacking references individually”).

Moreover, “there is no requirement that the prior art contain an express suggestion to combine known elements to achieve the claimed invention. Rather, the suggestion to combine may come from the prior art, as filtered through the knowledge of one skilled in the art.” *Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 1472 (Fed. Cir. 1997). Here, Petitioner refers to Wiglesworth for teaching benzovindiflupyras, an SDHI, as “extremely efficacious on soybean rust.” Pet. 53 (citing Ex. 1008, S2.11). Petitioner also refers to Tobler for teaching the same. *Id.* (citing Ex. 1006, 41:20–30, Table B1). Referring to claim 1 of Tobler, Petitioner contends that Tobler “suggests benzovindiflupyr and azole fungicides—like the ergosterol biosynthesis inhibitors of the ’727 patent—are synergistic when combined.” *Id.* (citing Ex. 1003 ¶ 201). We find Petitioner’s evidence and argument persuasive and determine that “an implicit motivation to combine . . . may

be gleaned from the prior art as a whole.” See *DyStar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006) (stating that an implicit motivation to combine may also exist when “the combination of references results in a product or process that is more desirable, for example because it is stronger, cheaper, cleaner, faster, lighter, smaller, more durable, or more efficient”); *KSR*, 550 U.S. at 421 (citing *DyStar*, 464 F.3d at 1367).

Patent Owner does not specifically address Petitioner’s showing as to whether there is a reasonable expectation of success. It, however, argues that “a POSA would not have assumed that all different fungicides are suitable or compatible for use as a mixed combination.” PO Resp. 63. To the extent this argument relates to an alleged lack of a reasonable expectation of success, we are not persuaded.

Claim 2 recites a fungicidal combination consisting of multiple fungicides. Other than the recited fungicides, it does not limit the combination in any way: not the efficacy, not the chemical and physical compatibility, and not the phytotoxicity of the combination. In addition, as Petitioner points out, Godoy teaches the combination of benzovindiflupyr + mancozeb + azoxystrobin are effective. Ex. 1005, 3. We agree with Petitioner that such evidence demonstrates the requisite reasonable expectation of success. Pet. 54 (citing Ex. 1003 ¶ 202).

In sum, Petitioner has shown, by a preponderance of the evidence, that De Oliveira in view of Wiglesworth, Tobler and Godoy, teaches or suggests all the limitations of claim 2, and that an ordinarily skilled artisan would have had a reason to combine the teachings to arrive at the subject matter of claim 2 with a reasonable expectation of success.

That, however, does not end our obviousness inquiry. Indeed, evidence of objective indicia of non-obviousness must be considered in every case in which they are presented. *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1328 (Fed. Cir. 2016). Such evidence, however, is only relevant if there is a nexus between the claimed invention and the objective indicia. *In re Affinity Labs of Tex., LLC*, 856 F.3d 883, 901 (Fed. Cir. 2017). There is no nexus unless the evidence presented is reasonably commensurate with the scope of the claims. *Id.* The patentee bears the burden of showing that a nexus exists. *WMS Gaming Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1359 (Fed. Cir. 1999).

Patent Owner contends that objective indicia demonstrate non-obviousness of the challenged claims. PO Resp. 70–79. Specifically, relying on Petitioner’s marketing of prothioconazole + benzovindiflupyr + mancozeb, “a claimed three-component combination,” Patent Owner contends that “there was a long-felt but unresolved need for the improved control of Asian soybean rust.” *Id.* at 70–71. Claim 2, however, is directed to a four-component combination. Thus, Patent Owner has not shown that the alleged long-felt but unresolved need is reasonably commensurate with the scope of claim 2.

Similarly, Patent Owner asserts that “testing described in EX1020 shows *unexpected and synergistic improvements* in yield, defoliation, and disease severity.” *Id.* at 72. As counsel for Patent Owner acknowledged at the hearing, however, none of the tested combinations, fall within the scope of claim 2. Tr. 55:2–8. Thus, even if the results there were unexpected, Patent Owner has not established a nexus between those results and claim 2.

Thus, for the reasons discussed above, we determine Petitioner demonstrates by a preponderance of the evidence that claim 2 would have been obvious over De Oliveira in view of Wiglesworth, Tobler and Godoy.

G. Section 112 Grounds

Petitioner asserts that claims 1–10 are invalid under 35 U.S.C. § 112(a) for lack of written description support. Pet. 73–76. Petitioner also argues that claims 1–10 are invalid under 35 U.S.C. § 112(a) because they are not enabled. *Id.* at 76–81.

The challenged claims are directed to fungicidal combinations, compositions, and methods of use thereof. Petitioner appears to recognize this. *See* Pet. 73 (stating “the claims are directed to known ingredients which were previously used effectively as fungicides in the art”). Petitioner, however, argues that during prosecution, the applicant distinguished the prior art based on the unexpected synergy achieved by the claimed combinations. Pet. 74 (citing Ex. 1002, 138); *see also id.* at 13 (the same). As a result, Petitioner asserts “the patent is not directed at the combination of fungicidal ingredients, but rather to the alleged synergistic interaction between them.” *Id.* at 74. Because this patentable distinction is not recited in the claims, Petitioner contends that the claims lack written description support. *Id.* Petitioner also argues that the ’727 patent “fails to enable the full use of the scope of claims 1–10 as fungicidal combinations providing enhanced efficacy and synergy.” *Id.* at 78 (quotation marks and ellipsis omitted).

The language in the prosecution history Petitioner relies on reads: “The technical effects achieved by the claimed combinations, i.e., an enhancement of the efficacy, and a surprising reduction in fungal disease incidence when mancozeb is added to the claimed combinations.”

Ex. 1002, 138. This language is ungrammatical and it is unclear what it actually means. For this reason, in our Decision to Institute, we “decline[d] to read a requirement of ‘synergistic interaction’ into the challenged claims.” DI 20.

Petitioner had an opportunity to respond to this issue in its Reply, but elected not to do so. *See* CTPG 73 (“[T]he Board will permit the petitioner, in its reply brief, to address issues discussed in the institution decision.”). Indeed, the Reply does not address Petitioner’s Section 112 challenges at all. Seeing no reason to modify our initial analysis on written description support and enablement, we incorporate by reference Section II.F of the Decision to Institute into this Decision.

In sum, based on the entire record developed at trial, we determine that Petitioner has not shown by a preponderance of the evidence that claims 1–10 are invalid under 35 U.S.C. § 112(a).

IV. PETITIONER’S MOTION TO EXCLUDE

Petitioner filed a Motion to Exclude Certain Opinions of Jacobsen Declaration. Paper 48 (“MTE”). Specifically, Petitioner argues that we should exclude Dr. Jacobsen’s opinions related to (1) public accessibility and availability of Godoy, as embodied in Exhibit 2020, paragraphs 88–90, and relied upon in pages 10, 11, 13, and 14 of the Patent Owner’s Response; and (2) determination and assessment of whether there is synergy in disease efficacy, yield, or defoliation, as embodied in Exhibit 2020, paragraphs 246–249, 251, 253–257, 259–267, 271, 272, Tables B–J, Appendix B, pages 1–95, and relied upon in pages 72–79 of the Patent Owner’s Response. *Id.* at 1 & nn. 2–4. Patent Owner filed an Opposition to

the MTE (Paper 51, “MTE Opp.”), and Petitioner filed a Reply in support of the MTE (Paper 53).

Petitioner, as the party moving to exclude evidence, bears the burden of proving that it is entitled to the relief requested, namely, that the material sought to be excluded is inadmissible under the Federal Rules of Evidence. *See* 37 C.F.R. §§ 42.20(c), 42.62(a); *see also* CTPG 8, 37 (explaining that a motion to exclude is based on inadmissibility).

For the reasons explained below, we dismiss in part and deny in part Petitioner’s MTE.

A. Testimony Related to Accessibility and Availability of Godoy

Petitioner argues that “Dr. Jacobsen’s declaration testimony that the Godoy reference was not publicly accessible or available is conclusory, unreliable, and contrary to the evidence, and therefore, prejudicial, inadmissible and should be excluded under FRE 403 and 702.” MTE 3 (heading normalized). According to Petitioner, “Dr. Jacobsen’s own testimony shows he is not qualified as an expert by ‘knowledge, skill, experience, training, or education’ to render opinions on the subject of the public availability of Godoy. Thus, Dr. Jacobsen’s testimony on Godoy’s availability is inadmissible.” *Id.* at 4.

Patent Owner counters that “Dr. Jacobsen is entitled to testify as an expert given his qualifications as (more than) a POSA.” MTE Opp. 3. Patent Owner points out that Dr. Jacobsen has published book chapters, peer-reviewed articles, and technical bulletins, and served as an editor and a technical editor of scientific papers. *Id.* at 4–5. According to Patent Owner, these experiences constitute “knowledge, skill, experience, [and] training” that qualifies Dr. Jacobsen as an expert to testify on Godoy’s public availability. *Id.* at 5.

We do not need to resolve the dispute of whether Dr. Jacobsen is qualified to opine on the public accessibility of Godoy as an expert because we agree with Patent Owner that “even if ‘library science’ expertise is required to offer opinions on public availability under FRE 703, Dr. Jacobsen’s testimony is admissible under FRE . . . 701.” MTE Opp. 6.

“[I]t is possible for the same witness to provide both lay and expert testimony in a single case.” Fed. R. Evid. 701 committee notes (2000 amendment). Here, Petitioner does not dispute that Dr. Jacobsen is qualified to offer expert opinion on the substantive matters. On the issue of Godoy’s public accessibility, Dr. Jacobsen testified that “[t]he Embrapa website attached to Dr. Hall-Ellis’s declaration has no ‘*publication date* of September 1, 2016’ shown.” Ex. 2020 ¶ 89. He also stated that

[e]ven if Godoy had been uploaded to the Embrapa website in 2016, this does not mean that Godoy was indexed or otherwise searchable prior to November 4, 2016. In my experience from teaching, publishing, and conducting research in plant pathology, I have seen it takes considerable time for a publication to be indexed and searchable. Based on this, it cannot be assumed that Godoy was indexed and searchable as of the date listed on its face. And, in my experience, once a publication is indexed, it is generally assigned a digital object identifier (“DOI”). I did not see any DOI for Godoy provided in the materials submitted with Syngenta’s petition. Without this indicium of being indexed, it cannot be assumed that Godoy was searchable as of the date listed on its face or by November 4, 2016.

Id. ¶ 90.

We find Dr. Jacobsen’s testimony in paragraphs 88–90 is “(a) rationally based on the witness’s perception; (b) helpful to clearly understanding the witness’s testimony or to determining a fact in issue; and (c) not based on scientific, technical, or other specialized knowledge within

the scope of Rule 702.” *See* Fed. R. Evid. 701. As such, it is admissible as opinion testimony by a lay witness.

We also are not persuaded that admission of Dr. Jacobsen’s testimony related to public accessibility and availability of Godoy would cause unfair prejudice to Petitioner. Similar to a district court in a bench trial, the Board, sitting as a non-jury tribunal with administrative expertise, is well-positioned to determine and assign appropriate weight to evidence presented. Therefore, we deny Petitioner’s motion to exclude Dr. Jacobsen’s testimony related to public accessibility and availability of Godoy, as embodied in Exhibit 2020, paragraphs 88–90.²⁵

B. Testimony Related to Disease Synergy

Pursuant to our Orders (Papers 22, 27), Petitioner produced the underlying data (Exs. 1031–1033) for the testing described in the Prates Declaration (Ex. 1020). Dr. Jacobsen analyzed those data and opined that they “demonstrate synergy for the claimed subject matter in fungus control, defoliation, and yield.” Ex. 2020 ¶ 246. Petitioner argues that Dr. Jacobsen’s opinions in his declaration on the synergy issue are contrary to his own deposition testimony and other evidence, “riddled with errors,” unreliable, and thus, should be excluded. MTE 6–14.

Patent Owner relies on Dr. Jacobsen’s opinions related to disease efficacy, defoliation, and yield purportedly to show unexpected results. *See* PO Resp. 72–79 (citing Ex. 2020 ¶¶ 240–272, Appendix B, pages 1–95). For evidence of objective indicia of nonobviousness, including unexpected

²⁵ We have considered this testimony from Dr. Jacobsen in our analysis above, but do not find it credible over the myriad competing evidence Petitioner presents showing that Godoy was publicly available prior to the critical date. *See supra* § III.D.2.

results, to be accorded substantial weight, Patent Owner must establish a nexus between the evidence and the merits of the claimed invention. *See Affinity Labs*, 856 F.3d at 901.

As explained above, because Petitioner has shown that claims 1 and 3–10 are anticipated by asserted prior art, we only consider obviousness of claim 2. *See supra* Sections III.F. Claim 2 is directed to a fungicidal combination consisting of four fungicides. At the hearing, counsel for Patent Owner acknowledged that the data Dr. Jacobsen analyzed in forming his opinions on synergy do not fall within the scope of claim 2. Tr. 55:2–8. As such, we do not consider Dr. Jacobsen’s opinions on synergy in our obviousness determination of claim 2. Therefore, we dismiss Petitioner’s MTE as moot in this regard.

V. MOTIONS TO SEAL

Petitioner filed an unopposed Motion for entry of a stipulated modified Protective Order. Paper 20. According to Petitioner, the parties have agreed upon a protective order that deviates from the Board’s default protective order. *Id.* Patent Owner filed a marked-up comparison of the proposed and default protective orders (*Id.*, Ex. 1) and a clean copy of the proposed protective order (*Id.*, Ex. 2). The Protective Order (Paper 20, Ex. 2) is hereby entered. It shall govern the conduct of the proceeding unless otherwise modified.

There is a strong public policy for making all information filed in a post-grant review open to the public, especially because the proceeding determines the patentability of claims in an issued patent and, therefore, affects the rights of the public. Generally, all papers filed in an *inter partes* review shall be made available to the public. *See* 35 U.S.C. § 326(a)(1); 37 C.F.R. § 42.14. Our rules, however, “aim to strike a balance between the

public's interest in maintaining a complete and understandable file history and the parties' interest in protecting truly sensitive information." Patent Trial and Appeal Board Consolidated Trial Practice Guide 19 (November 2019) ("TPG").²⁶ Thus, a party may move to seal certain information (37 C.F.R. § 42.14); but only "confidential information" is protected from disclosure (35 U.S.C. § 326(a)(7)). Confidential information means trade secret or other confidential research, development, or commercial information. 37 C.F.R. § 42.2. The standard for granting a motion to seal is "for good cause." 37 C.F.R. § 42.54(a).

Patent Owner filed two Motions to Seal (Papers 30, 45), seeking to seal portions of its Response (Paper 31), Sur-reply (Paper 46), and Dr. Jacobsen's Declaration (Ex. 2020). Patent Owner also filed a public version of Papers 31 and 46, as well as Exhibit 2020. According to Patent Owner, the redacted information is based on Petitioner's Exhibits 1031–1033 that Petitioner has filed under seal. Papers 30, 45.

At the hearing, we alerted Petitioner to the fact that Exhibits 1031–1033 were filed as "Board and Parties Only" with no corresponding motion to seal. Tr. 4:10–19. We also explained, that if Petitioner wishes for this information to remain sealed, Petitioner should file a motion that provides a "proper basis" for sealing the information. *Id.* To this day, no such motion has been filed.

Without any explanation from Petitioner as to why the information in Exhibits 1031–1033 constitutes confidential information, we find no good

²⁶ Available at <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=>.

cause to grant Patent Owner's Motions to Seal (Papers 30, 45). They are denied.

Petitioner may, within five business days of this Decision, file a motion to seal Exhibits 1031–1033. Such a motion shall explain in detail what good cause supports granting the motion. Patent Owner may renew its motions to seal within five business days of the filing of Petitioner's motion to seal. In the absence of such motions, at the expiration of ten business days from the date of this Decision, the entirety of Exhibits 1031–1033, Patent Owner's Response, Sur-reply, and Exhibit 2020 will be made available to the public.

VI. CONCLUSION²⁷

After reviewing the entire record and weighing evidence offered by both parties, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–10 of the '727 patent are unpatentable.

²⁷ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. §§ 42.8(a)(3), (b)(2).

In summary:

Claim(s)	35 U.S.C. §	Reference(s) /Basis	Claims Shown Unpatentable	Claim(s) Not Shown Unpatentable
1, 3–5, 7, 9, 10	102(a)(1)	Godoy	1, 3–5, 7, 9, 10	
1, 3–10	102(a)(1)	Tobler	1, 3–10	
1–10 ²⁸	103	De Oliveira, Wiglesworth, Tobler, Godoy	2	
1–10 ²⁹	103	Tobler, Godoy		
1–10	112	Written Description		1–10
1–10	112	Enablement		1–10
Overall Outcome			1–10	

²⁸ Because Petitioner has shown that asserted prior art references anticipate claims 1 and 3–10, we do not address whether these claims would have been obvious over De Oliveira, either alone or in view of Wiglesworth, Tobler, and Godoy.

²⁹ Having determined that Petitioner has shown all challenged claims are unpatentable under other grounds, we do not address this obvious ground. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding a petitioner “is entitled to a final written decision addressing all of the claims it has challenged”); *Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (recognizing that the “Board need not address issues that are not necessary to the resolution of the proceeding” and, thus, agreeing that the Board has “discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

VII. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, Petitioner has demonstrated by a preponderance of the evidence that claims 1–10 of the '727 patent are unpatentable;

FURTHER ORDERED that Petitioner's Motion to Submit Supplemental Information (Paper 14) is granted;

FURTHER ORDERED that Petitioner's Motion to Exclude (Paper 48) is denied-in-part and dismissed-in-part;

FURTHER ORDERED that Patent Owner's Motions to Seal (Papers 30, 45) are denied;

FURTHER ORDERED that Petitioner may file, and Patent Owner may renew, appropriate motions to seal as instructed in this Decision; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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